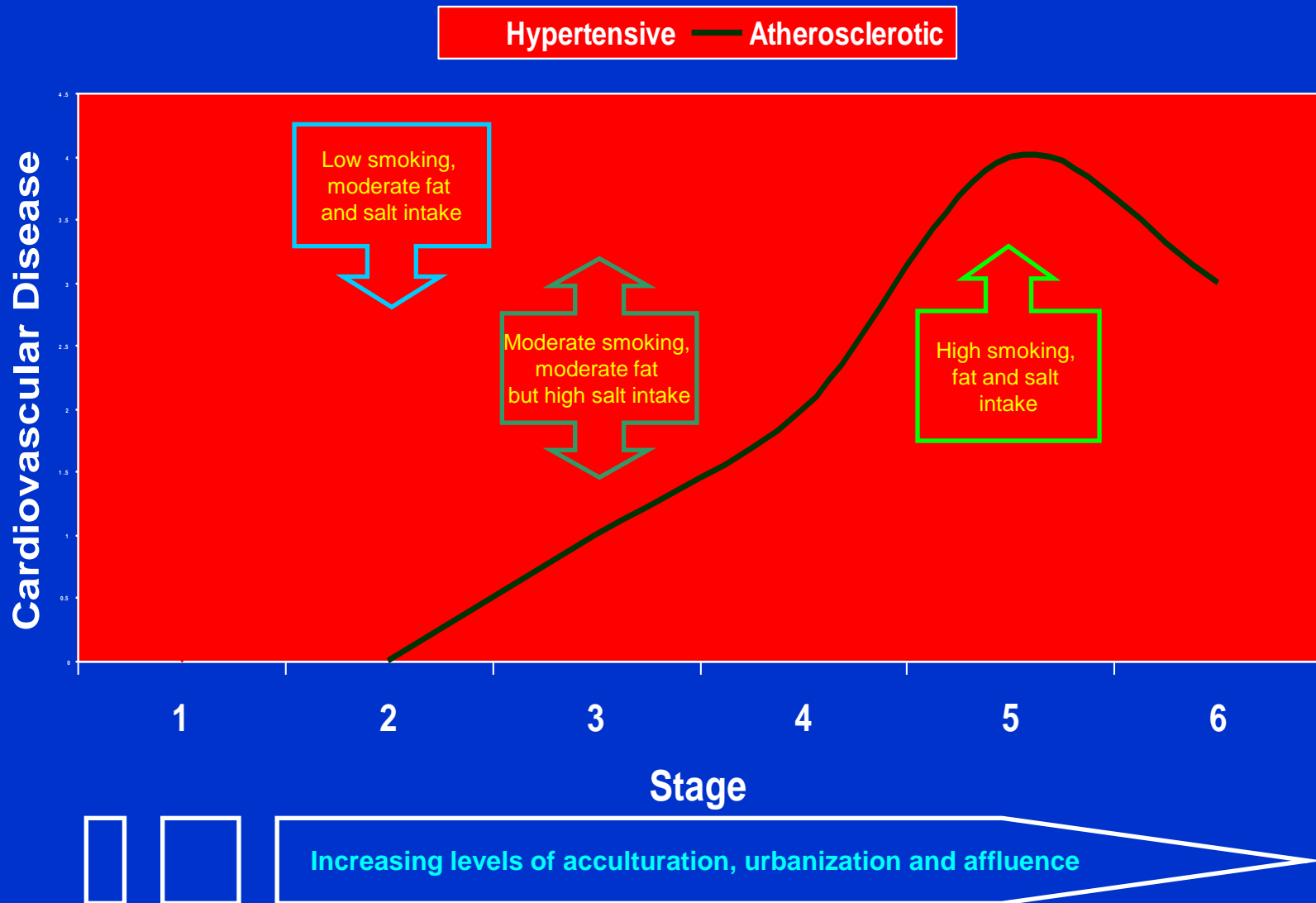


Lifestyle Changes that can help Control Hypertension

Daniel T. Lackland

Stages in the epidemiological transition of C.V.D.



Causes

- The Japanese eat very little fat and suffer fewer heart attacks than the British or Americans.
- The French eat a lot of fat and also suffer fewer heart attacks than the British or Americans.
- The Japanese drink very little red wine and suffer fewer heart attacks than the British or Americans.
- The Italians drink excessive amounts of red wine and also suffer fewer heart attacks than the British or Americans.
- **CONCLUSION: Eat and drink what you like. Speaking English is apparently what kills you.**

JNC 7: Management of Hypertension by BP Classification

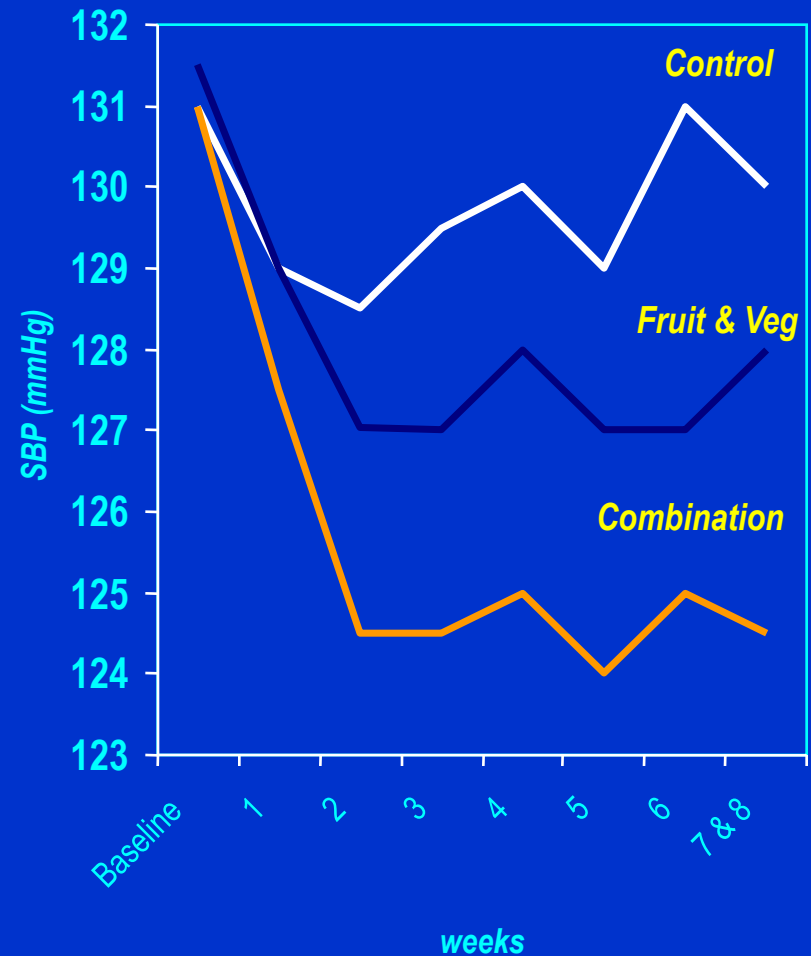
BP Classification	Lifestyle Modification	Initial Drug Therapy	
		Without Compelling Indication	With Compelling Indication
Normal < 120/80 mm Hg	Encourage		
Pre-hypertension 120-139/80-89 mm Hg	Yes	No drug indicated	Drug(s) for the compelling indications
Stage 1 hypertension 140-159/90-99 mm Hg	Yes	Thiazide-type diuretics for most; may consider ACE-I, ARB, BB, CCB, or combination therapy as first line	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE-I, ARB, BB, CCB) as needed
Stage 2 hypertension ≥ 160/100 mm Hg	Yes	2-drug combination as first line for most (usually thiazide-type diuretic and ACE-I, ARB, BB, or CCB)	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE-I, ARB, BB, CCB) as needed

Benefit of Lifestyle Modifications in Hypertension Management

	<u>Bp Effect</u>
DASH Diet	8-14 mmHg
Weight Loss	10Kg- 5- 20mmHg
Low Sodium Diet	2-8 mmHg
Reduce Alcohol Intake	2-4 mmHg
Regular Exercise	4-9 mmHg

D.A.S.H. diet

- High fruit & vegetables
- Low fat dairy products
- Whole grains & Nuts
- Poultry & Fish
- Little red meat, sweets, sugar-containing drinks
- Reduced total and saturated fat
- Reduced cholesterol



N Engl J Med 1997;336:1117-24

Dietary Approaches to Stop Hypertension *The Dash Diet*

8 Weeks of DASH Diet

Systolic	– 11.6 mmHg
Diastolic	-5.3 mmHg

DASH Diet

Fruit
Vegetables
Low Fat Foods

African Americans

8 Weeks DASH Diet

Systolic	-13.2 mmHg
Diastolic	- 6.1 mmHg

More Information: <www.nhlbi.nih.gov>

Trial Of Non-pharmacological intervention in the Elderly (TONE):

weight (-3.5kg) and sodium (-40mmol/d) reductions in elderly patients (60-80 yrs) ► BP reduction (-30%)

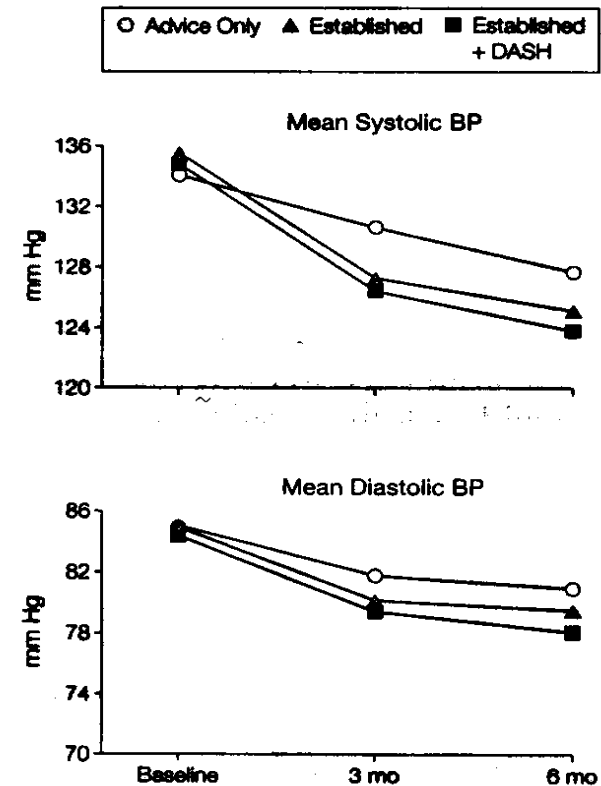
Diet, Exercise and Weight loss Intervention Trial (DEW-IT):

DASH-diet + fitness program ► -4.9kg and -12/-6mmHg

PREMIER Clinical Trial

- 4 centers RCT
- 810 adults
- Women 62%
- African-Americans 34%
- BP 120-159 / 80-95 mmHg
- Not on therapy
- Treatment arms:
 - Advice only (n=273)
 - Established recommend. (n=268)
 - Established plus DASH (n=269)
- Duration: 6 months

Figure 2. Mean Systolic and Diastolic Blood Pressure (BP) Over Time by Randomized Group

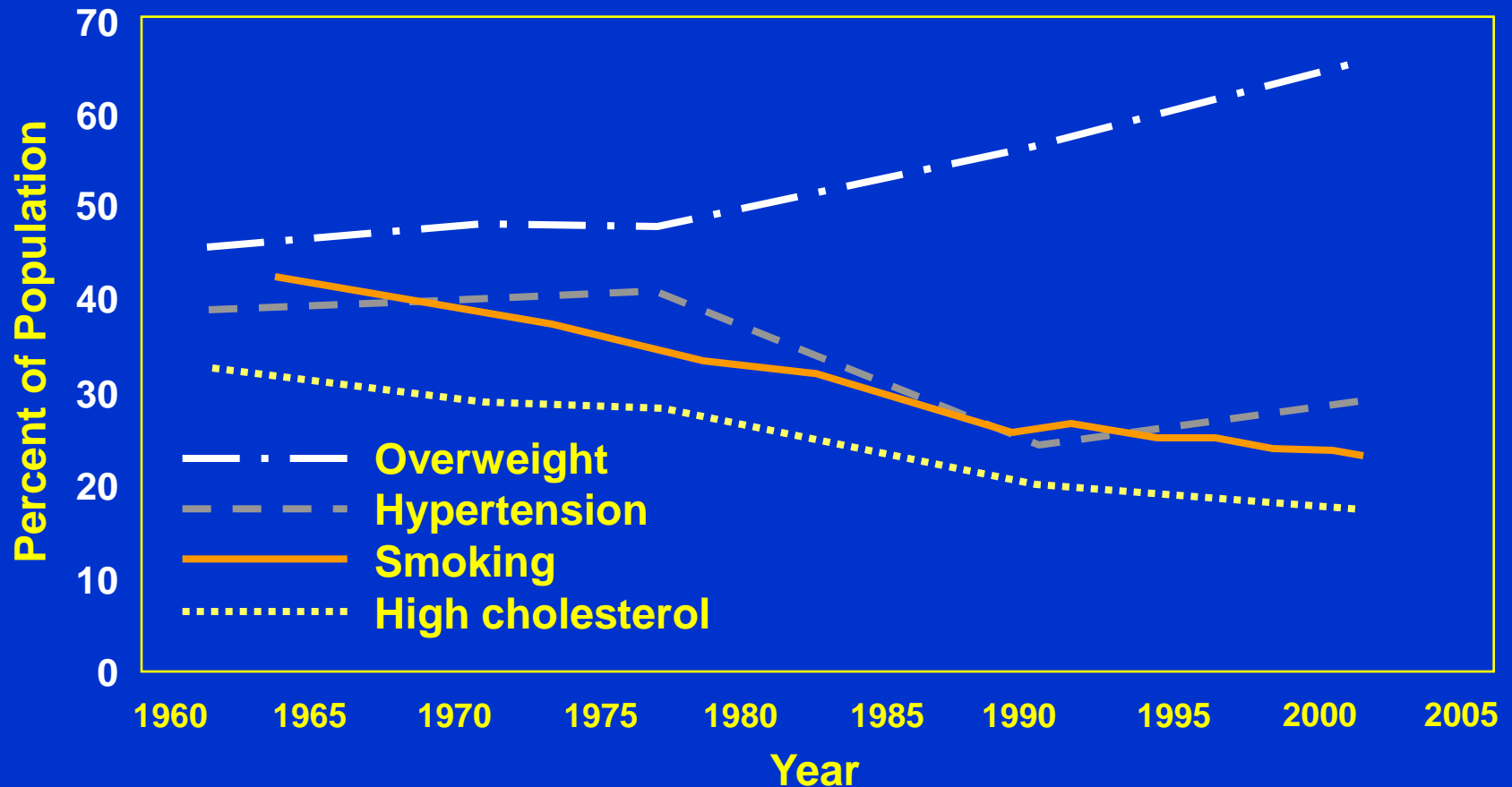


DASH indicates Dietary Approaches to Stop Hypertension.

Benefit of Lifestyle Modifications in Hypertension Management

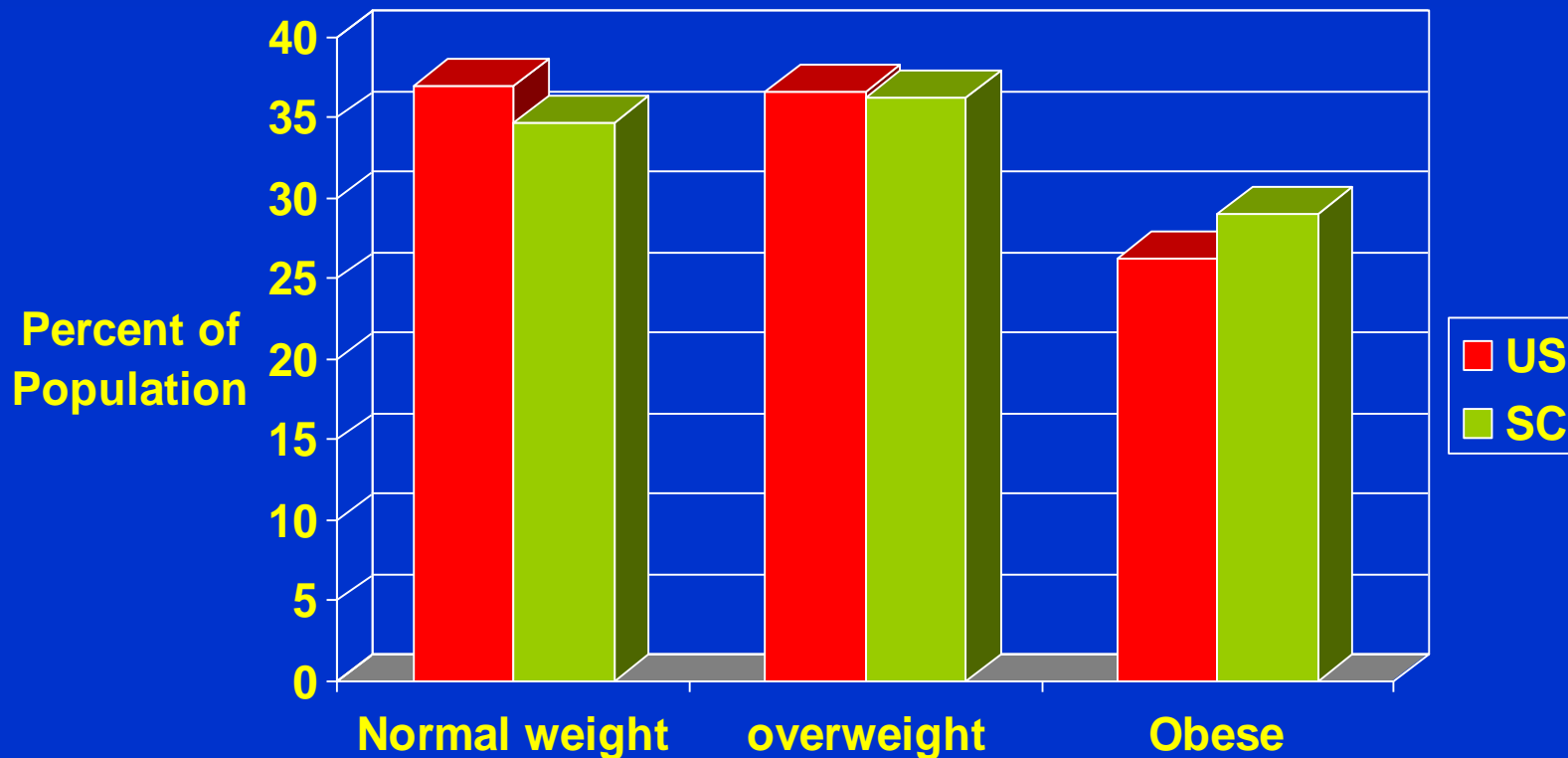
	<u>Bp Effect</u>
DASH Diet	8-14 mmHg
Weight Loss	10Kg- 5- 20mmHg
Low Sodium Diet	2-8 mmHg
Reduce Alcohol Intake	2-4 mmHg
Regular Exercise	4-9 mmHg

Prevalence of CVD Risk Factors in Adults: 1961-2001



Reproduced with permission from National Institutes of Health, National Heart, Lung, and Blood Institute. *Fact Book Fiscal Year 2005*. 2005:52.

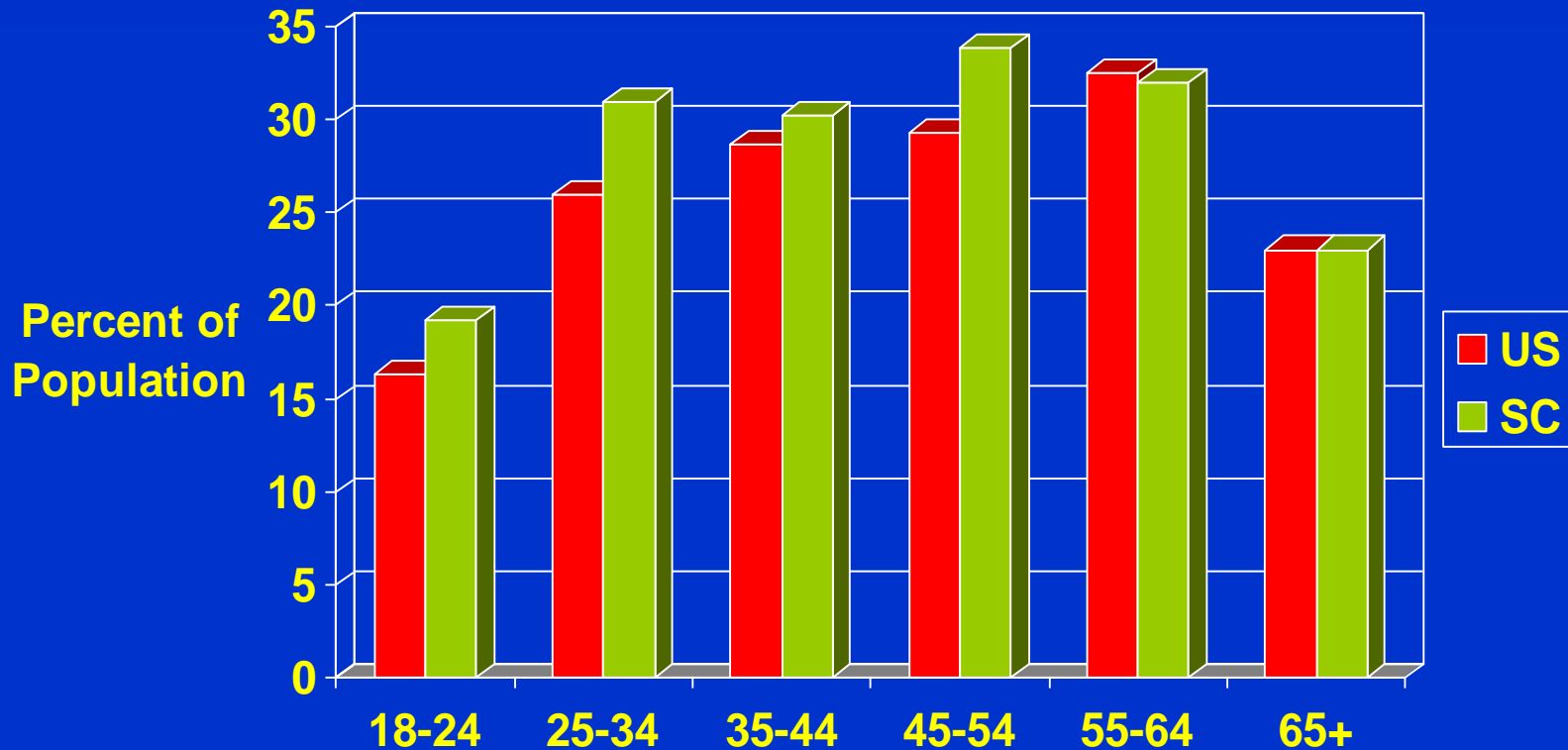
Body Size Adults US and SC 2007



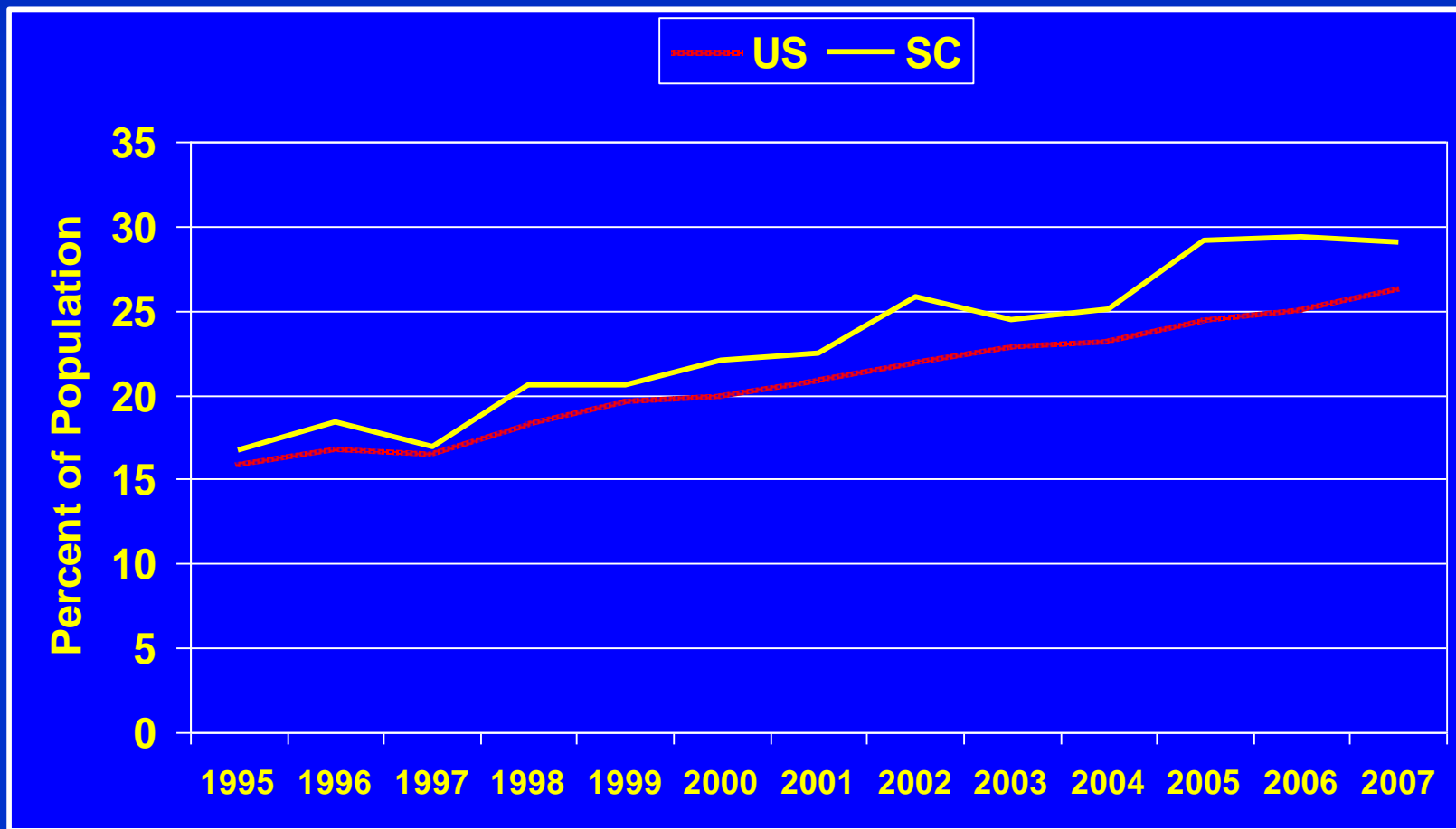
Obesity by age

Adults US and SC

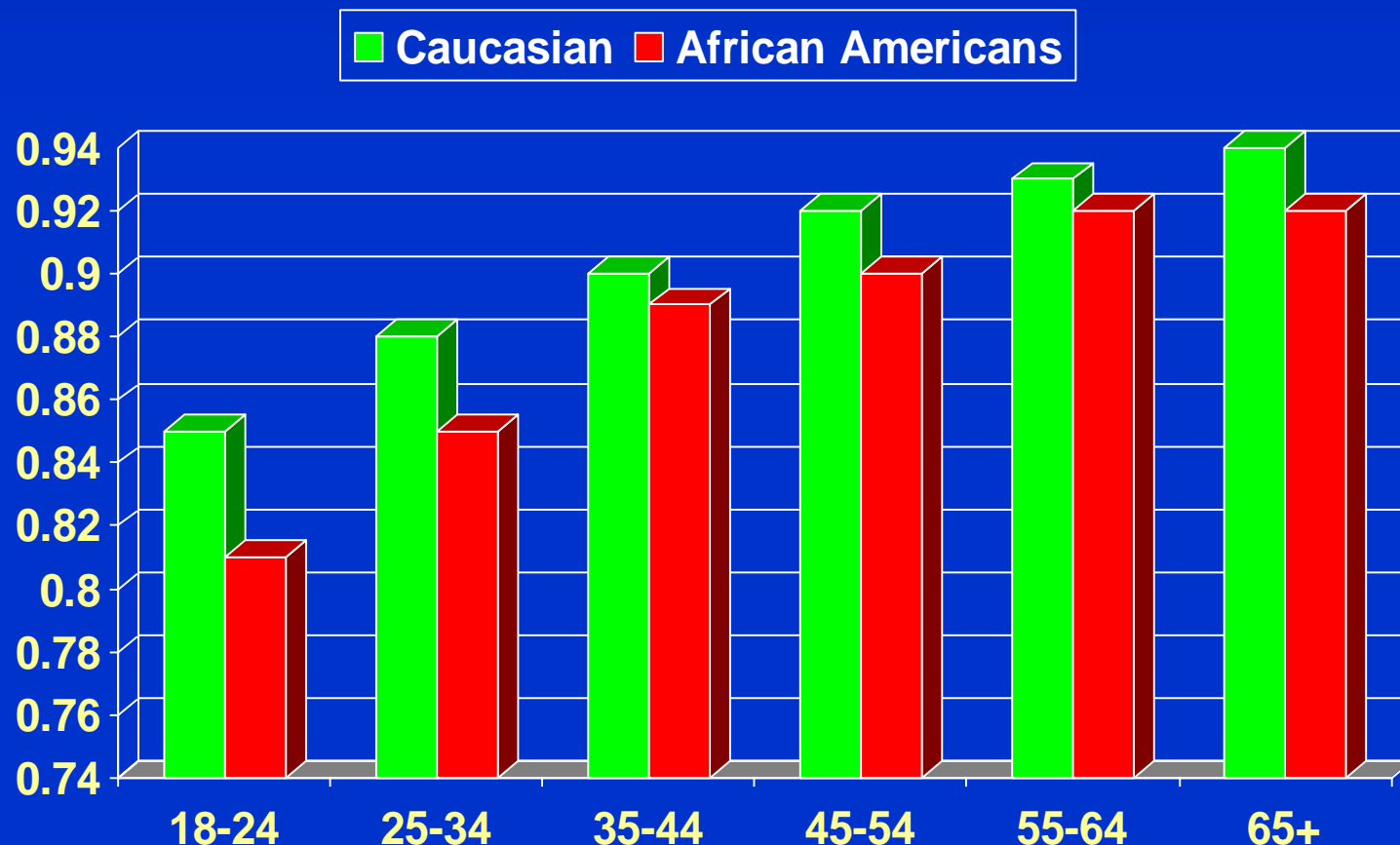
2007



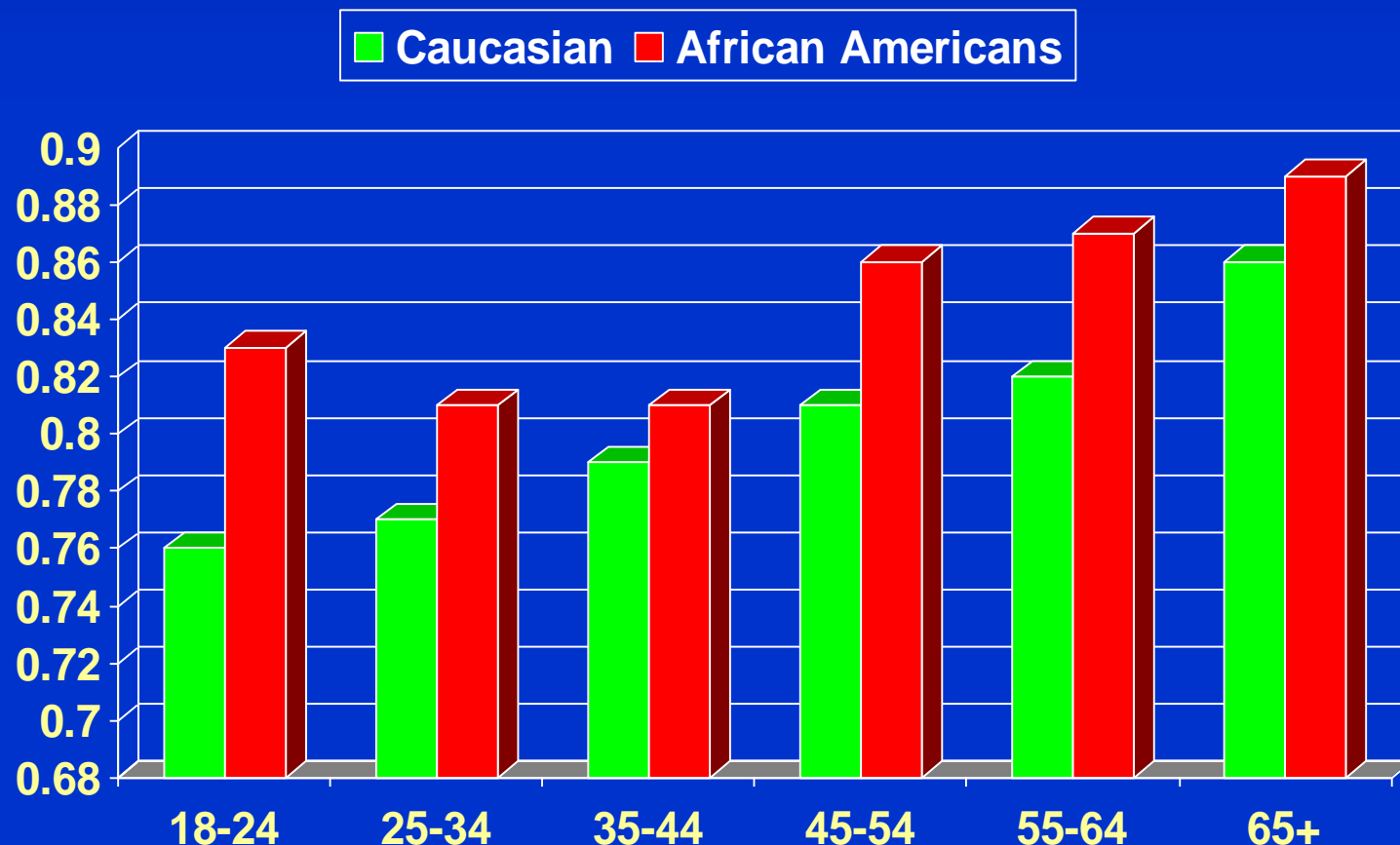
Obesity US and SC 2007

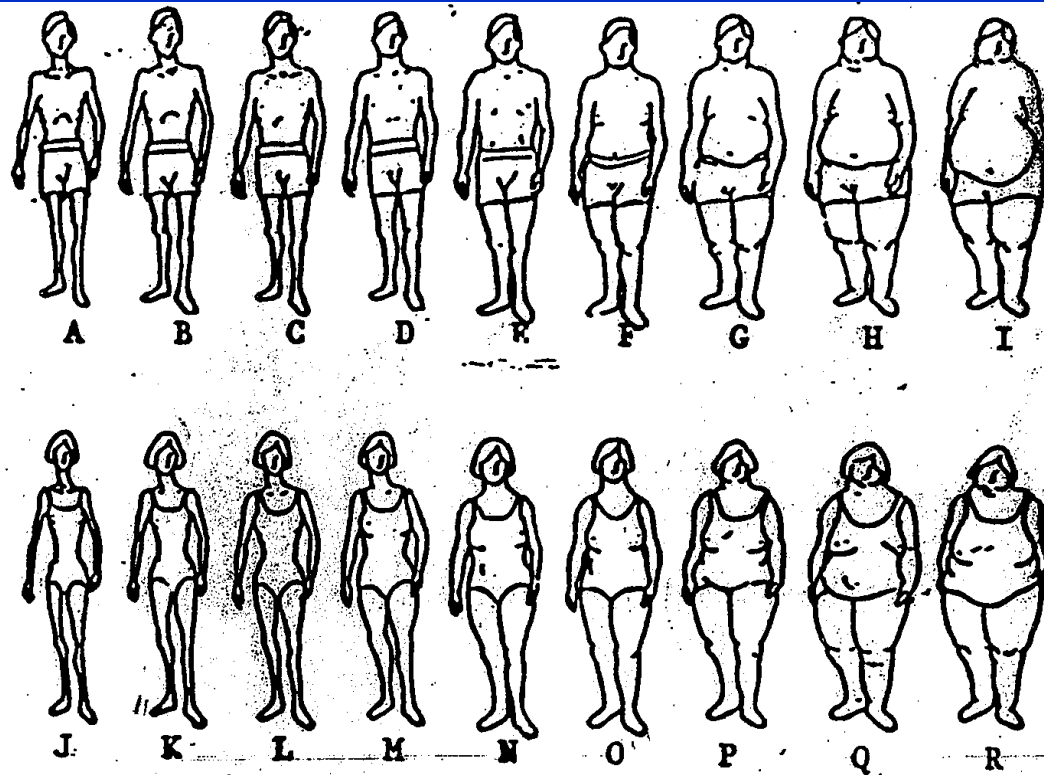


Mean Waist to Hip Ratio Males [At-Risk WHR > .9]



Mean Waist to Hip Ratio Females [At-Risk WHR > .85]





Ethnicity and Disease 17:617-623, 2007.

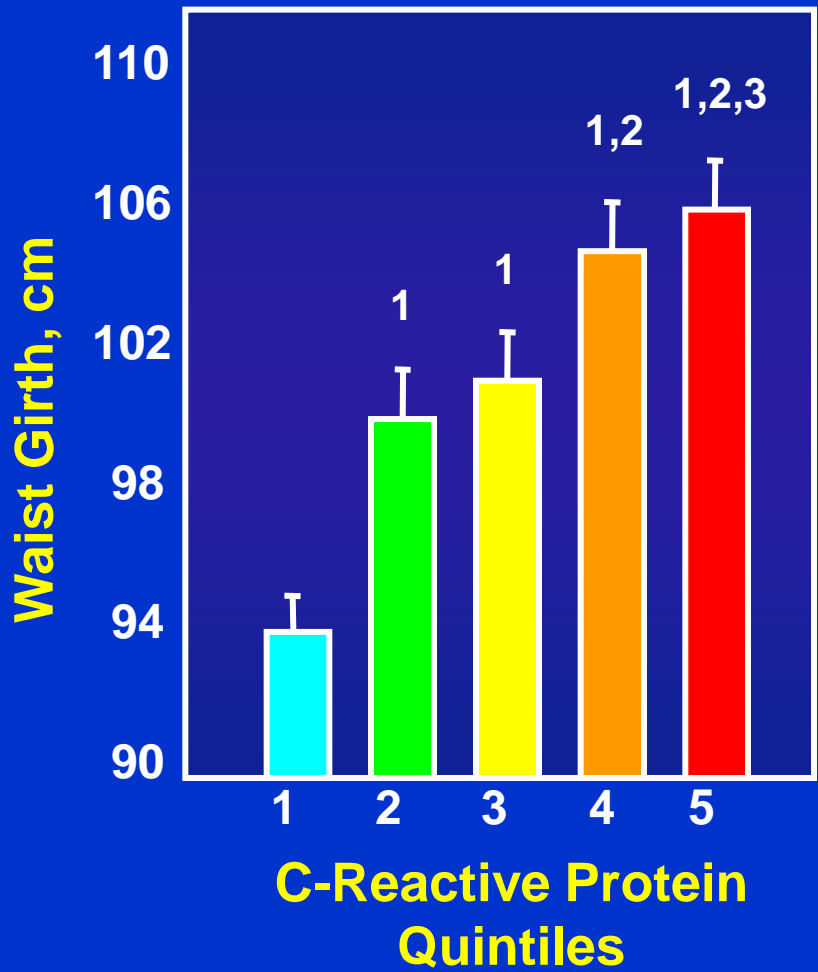
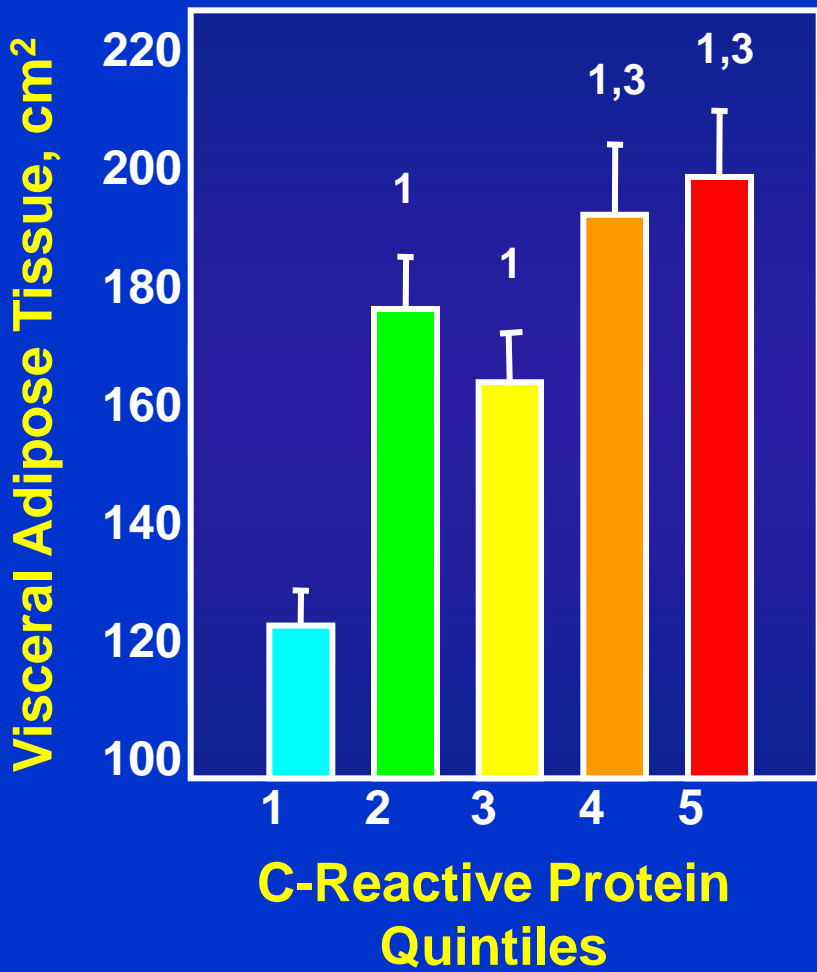
Men – 2003			
BMI Category	Smaller than Ideal	Satisfied	Larger than Ideal
Normal	45.5	40.6	11.9
Overweight	10.0	54.0	32.0
Obese	4.9	39.0	53.6
Total	27.6	43.8	26.0

Men – 2006	Smaller than Ideal	Satisfied	Larger than Ideal
BMI Category			
Normal	47.4	35.3	13.3
Overweight	12.2	46.7	37.8
Obese	4.2	26.8	64.8
Total	28.7	36.5	30.8

Women– 2003	Smaller than Ideal	Satisfied	Larger than Ideal
BMI Category			
Normal	15.6	57.8	25.9
Overweight	1.6	19.7	73.8
Obese	5.0	5.0	90.0
Total	10.2	39.0	49.2

Women– 2006	Smaller than Ideal	Satisfied	Larger than Ideal
BMI Category			
Normal	25.4	48.2	25.4
Overweight	0.0	22.1	76.6
Obese	0.0	6.2	93.9
Total	14.6	34.0	50.5

Obesity Is Associated With Inflammation

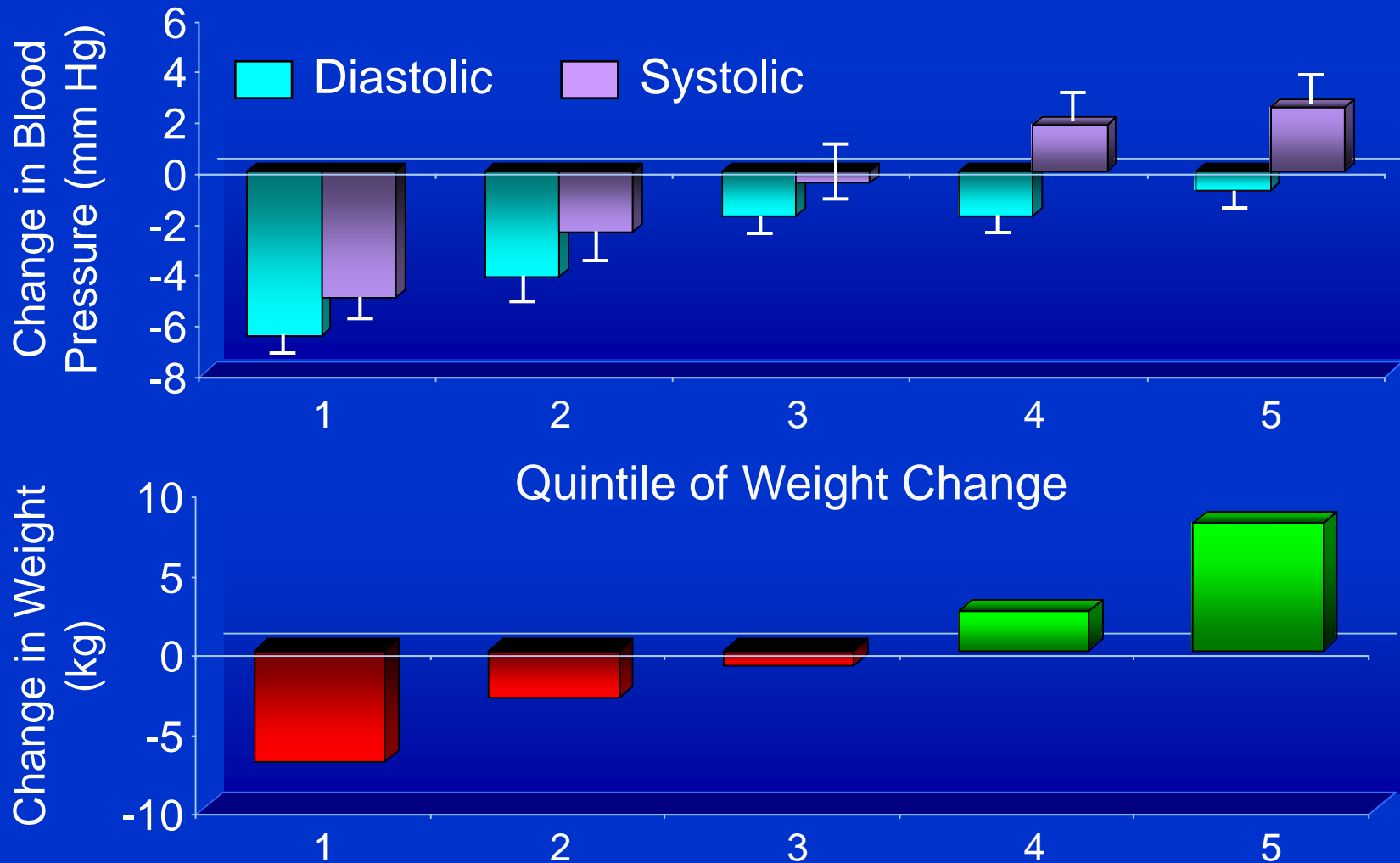


Impact of Weight Loss on Risk Factors

	~5% Weight Loss	5%-10% Weight Loss
HbA1c	 1	 1
Blood Pressure	 2	 2
Total Cholesterol	 3	 3
HDL Cholesterol	 3	 3
Triglycerides		 4

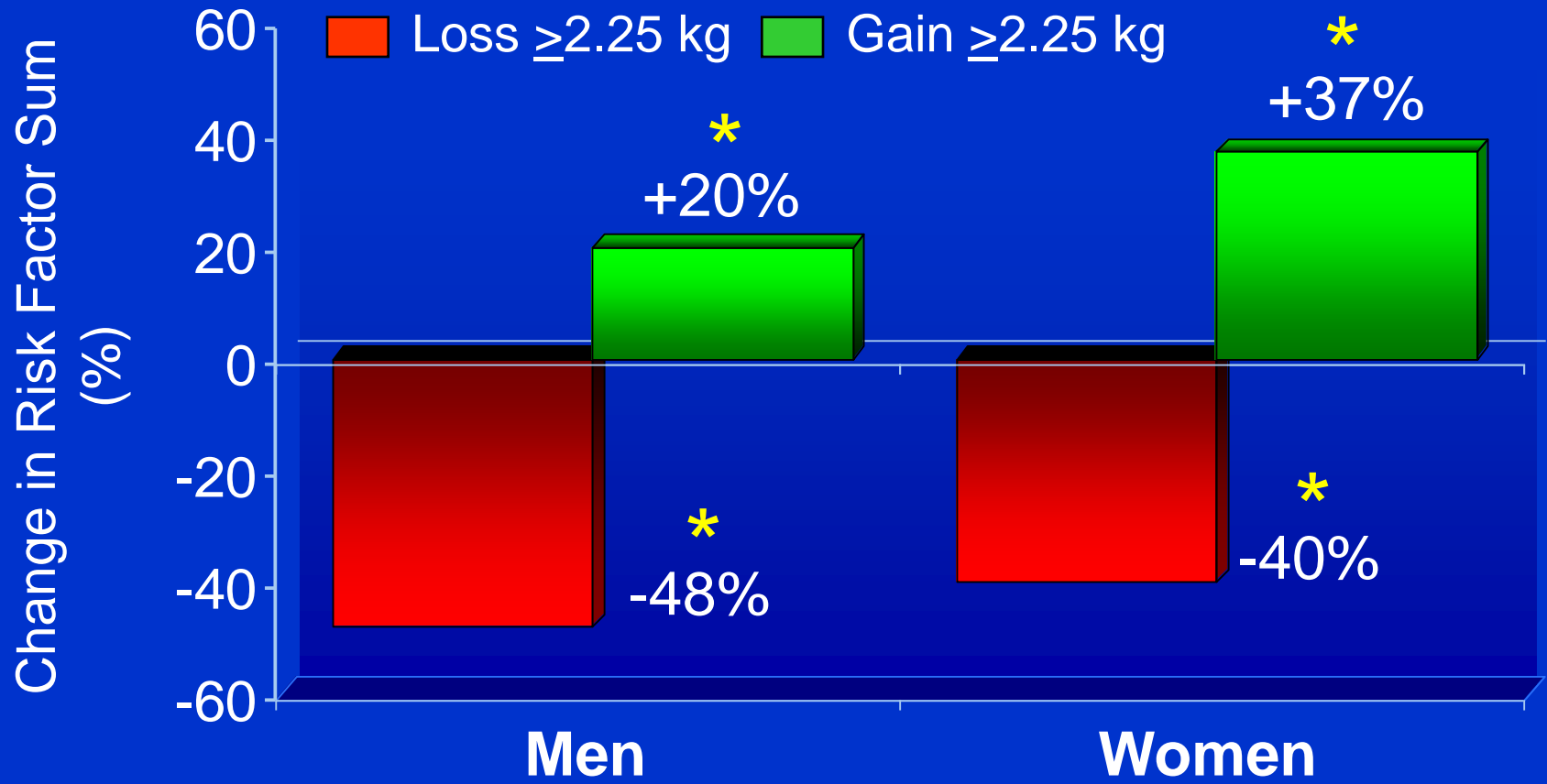
1. Wing RR et al. *Arch Intern Med.* 1987;147:1749-1753.
2. Mertens IL, Van Gaal LF. *Obes Res.* 2000;8:270-278.
3. Blackburn G. *Obes Res.* 1995;3 (Suppl 2):211S-216S.
4. Ditschuneit HH et al. *Eur J Clin Nutr.* 2002;56:264-270.

Relationship Between Change in Weight and Blood Pressure: Trials of Hypertension Prevention II



Relationship Between Weight Change and CHD Risk Factor Sum: Framingham Offspring Study

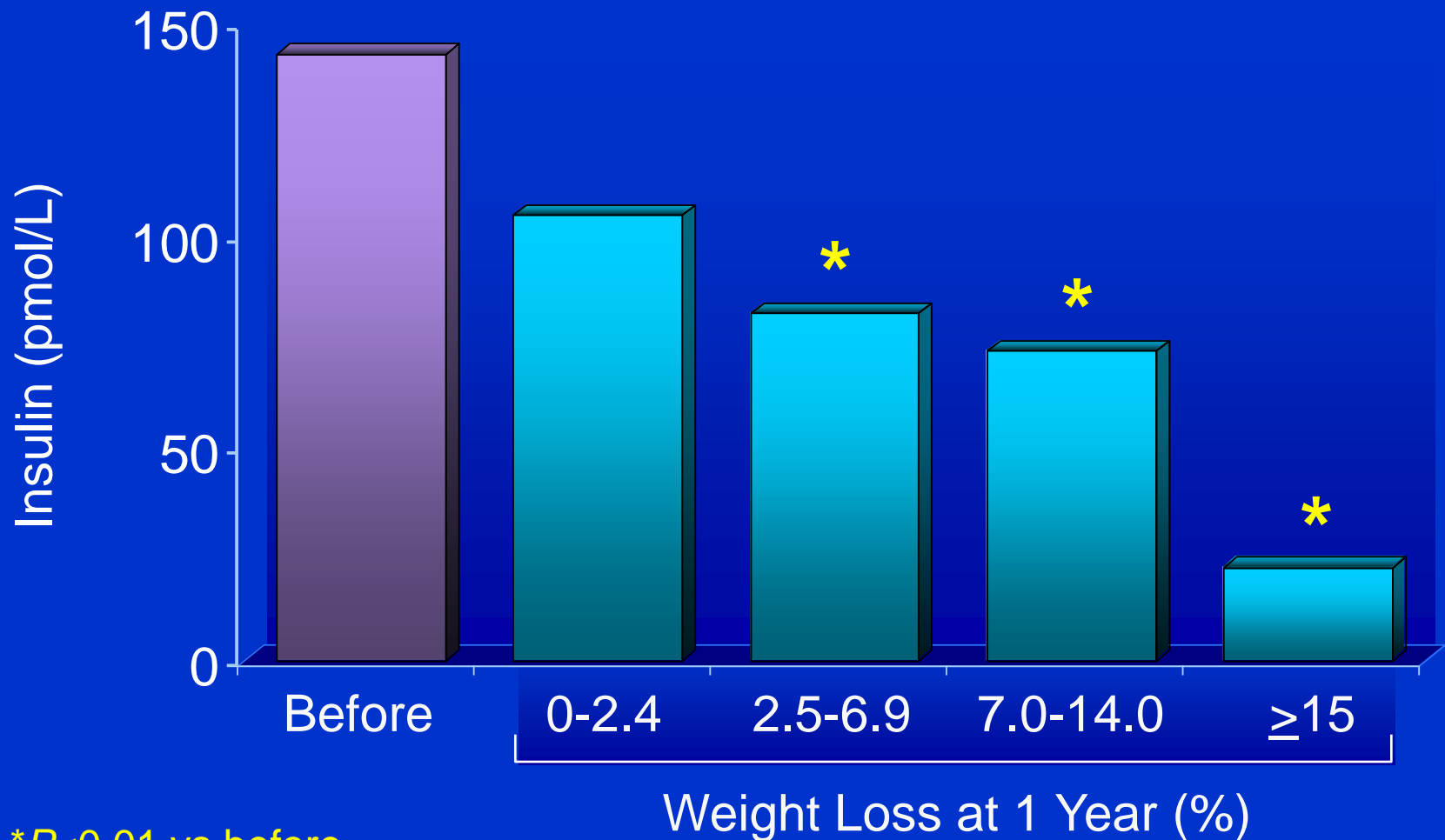
Weight Change During 16-y Follow-up



* $P < 0.002$ vs baseline.

Wilson et al. *Arch Intern Med* 1999;159:1104.

Insulin Sensitivity Improves with Weight Loss in Patients with Type 2 Diabetes

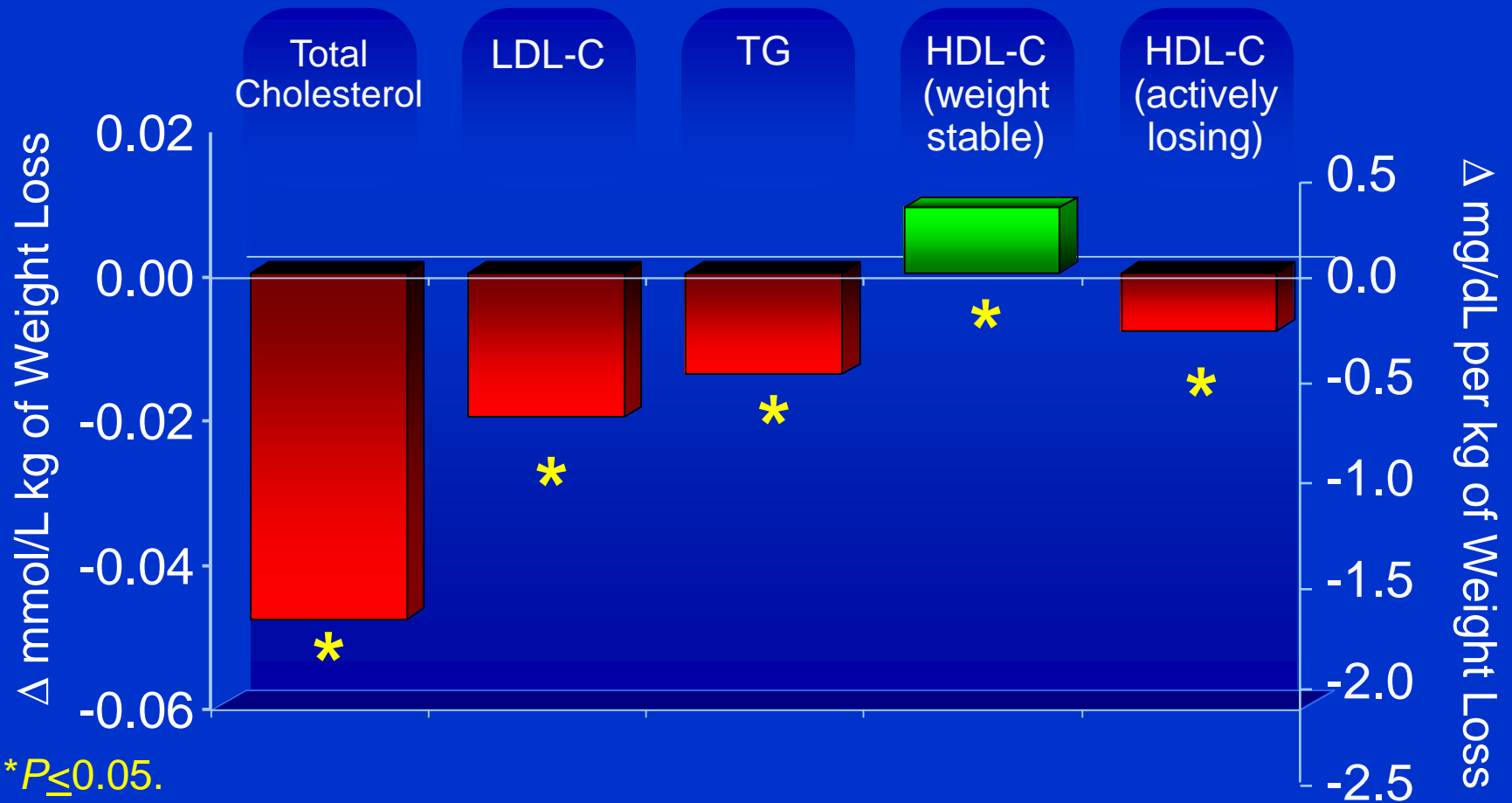


* $P < 0.01$ vs before.

Wing et al. *Arch Intern Med* 1987;147:1749.

Plasma Lipids Improve with Weight Loss

Meta-analysis of 70 Clinical Trials

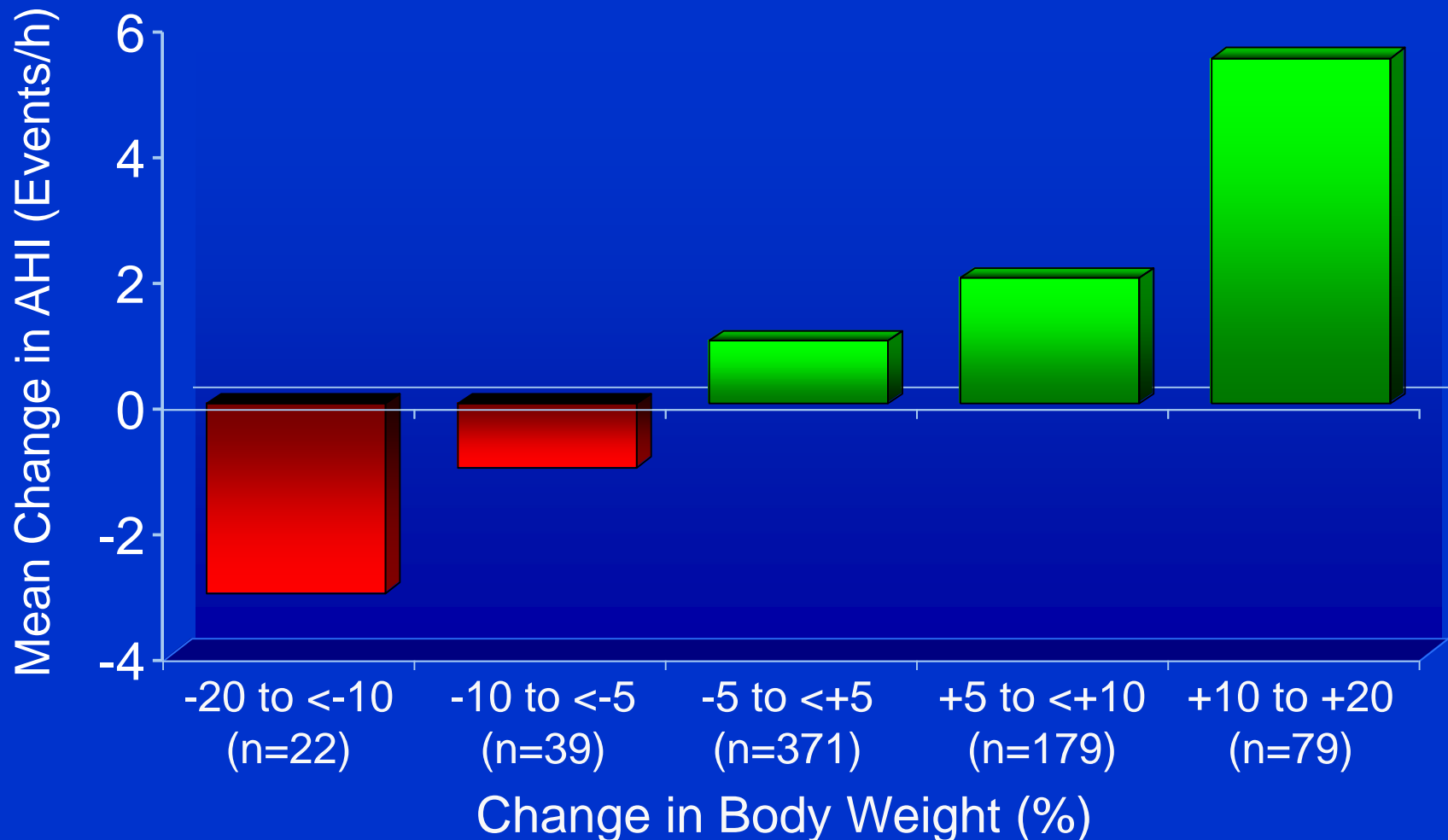


* $P < 0.05$.

LDL-C=low density lipoprotein cholesterol; HDL-C=high-density lipoprotein cholesterol;
TG=triglycerides

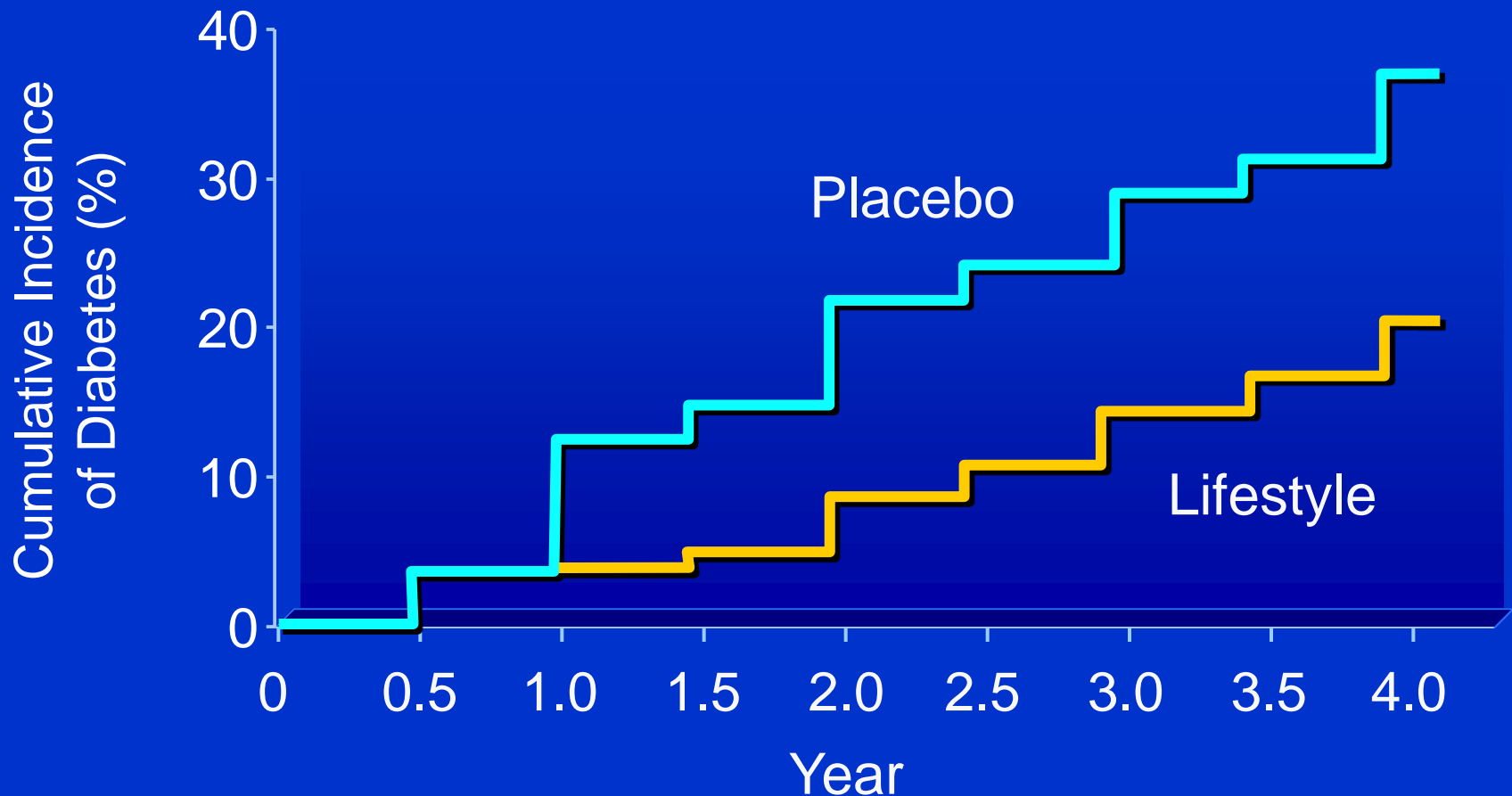
Dattilo et al. *Am J Clin Nutr* 1992;56:320.

Effect of Weight Change on Apnea-Hypopnea Index (AHI)



Peppard et al. *JAMA* 2000;284:3015.

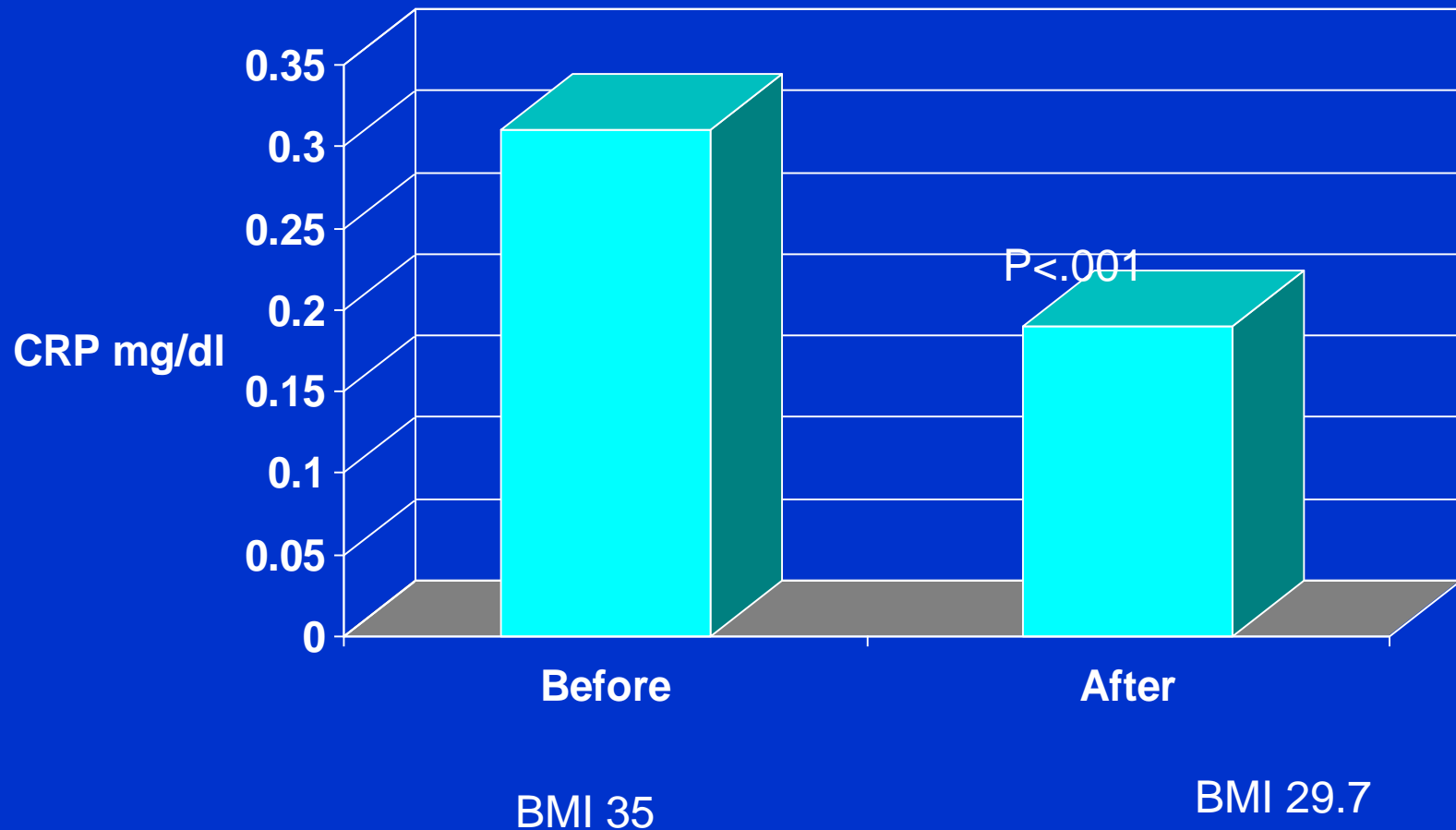
Modest Weight Loss Prevents Diabetes in Overweight and Obese Persons with Impaired Glucose Tolerance



Weight Change and Risks of Diabetes and Metabolic Syndrome

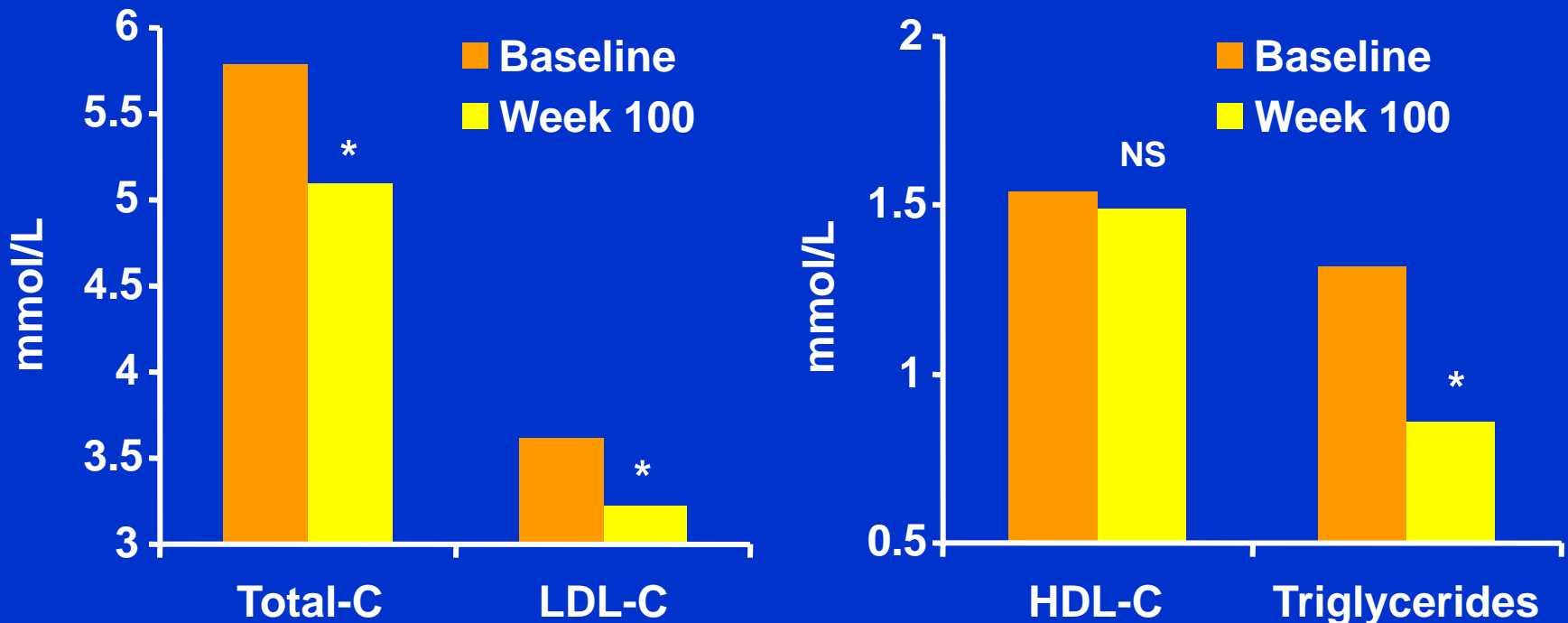
- A 5.6 % reduction in weight was associated with a 58% reduced risk of diabetes.
- A 5.6 % reduction in weight was associated with a 41% reduced risk of metabolic syndrome.

CRP Before and After Weight Loss in Obese Postmenopausal Women



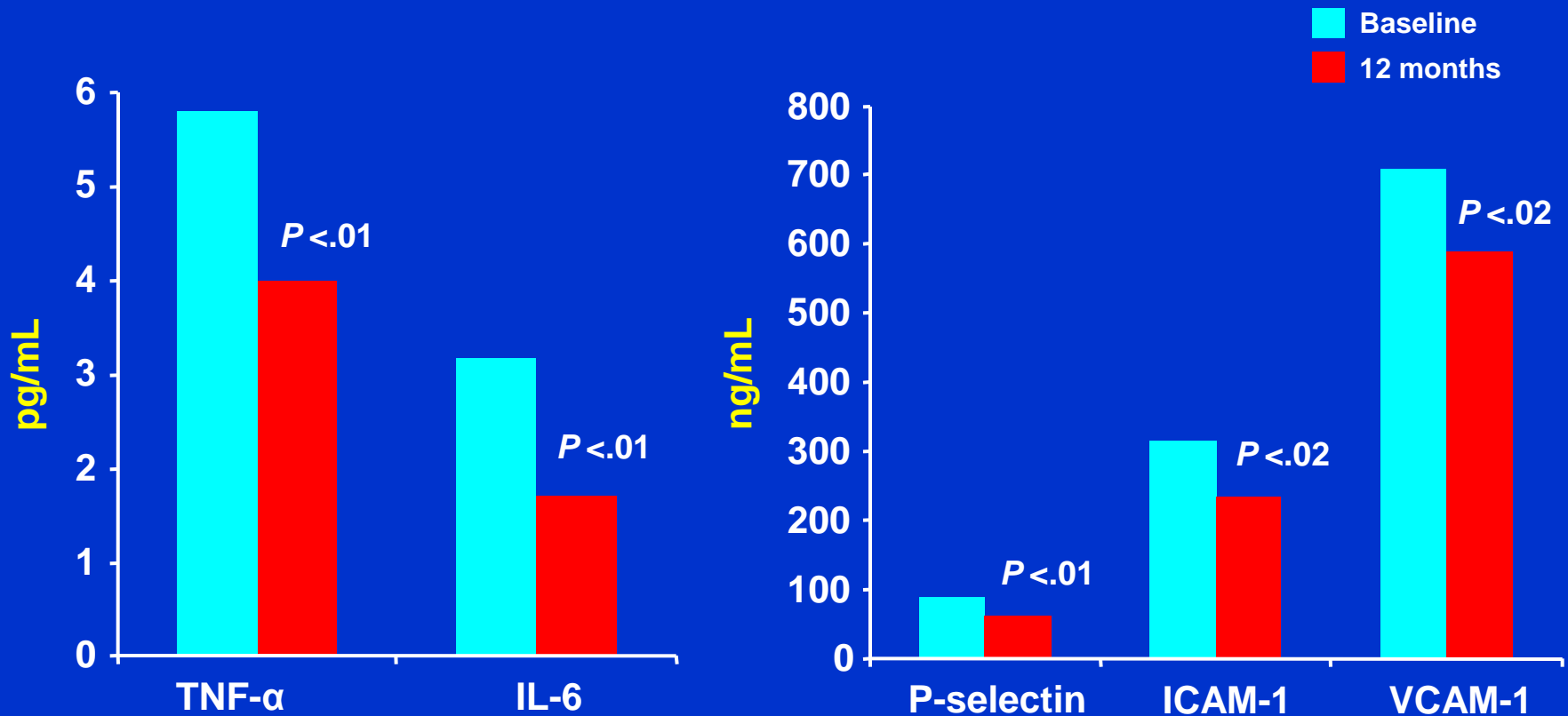
Changes in Lipid Profile Associated With >10% Weight Loss in Obese Women

Lipid values for patients (n = 14) who, at week 100, maintained a reduction in initial weight of >10% (48-week weight-loss program)



* $P < .05$.

Effects of Weight Loss* on Inflammatory Biomarkers



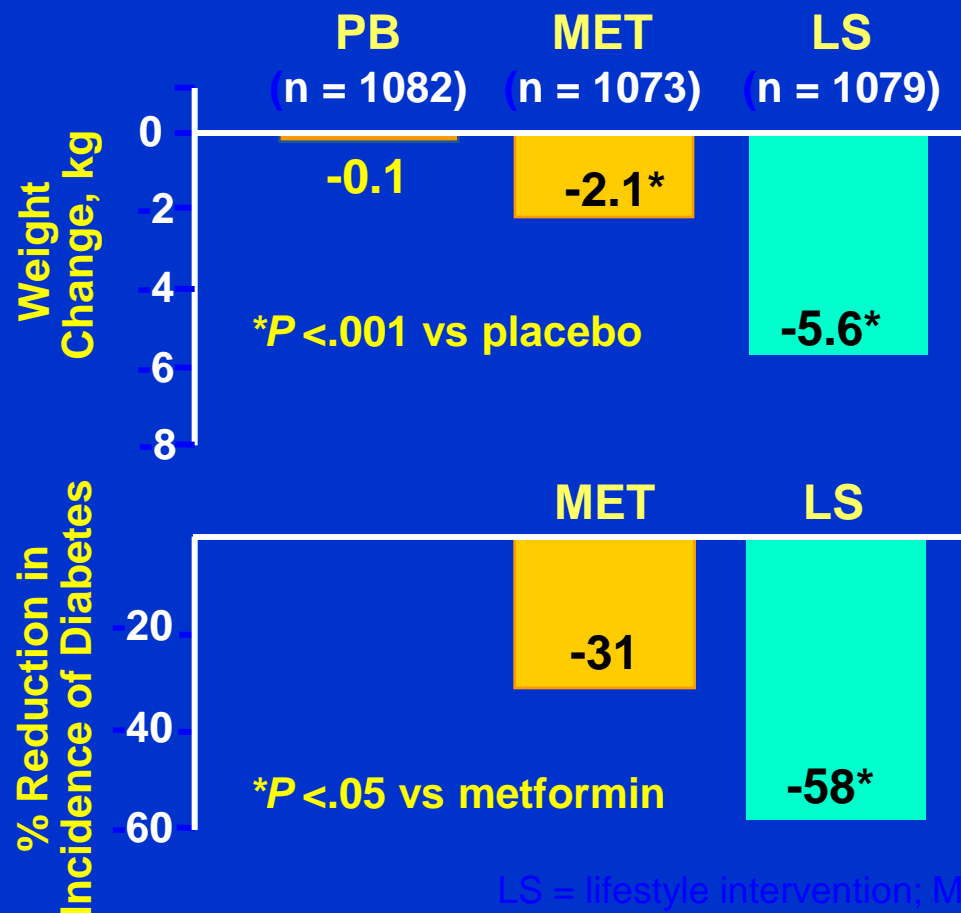
*Mean decrease of 9.8±1.5 kg.

ICAM = intercellular adhesion molecule; IL-6 = interleukin 6; TNF = tumor necrosis factor;
VCAM = vascular cell adhesion molecule.

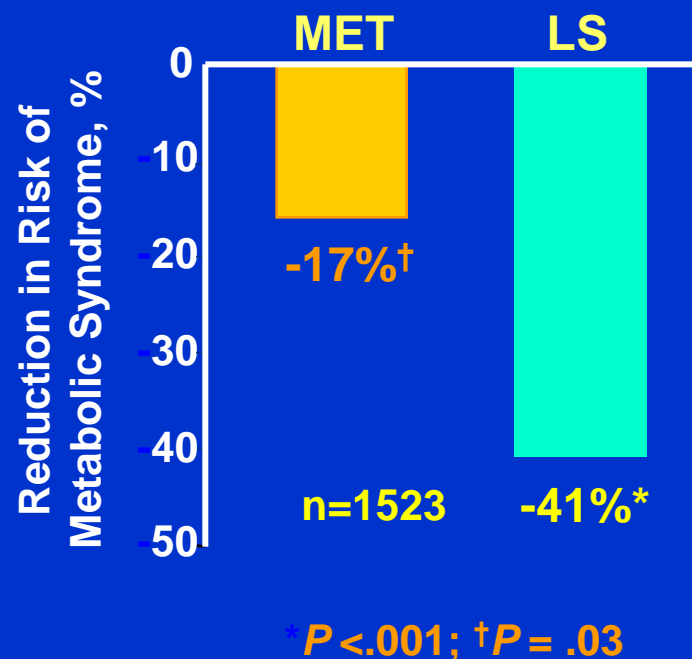
Adapted from Ziccardi P, et al. *Circulation*. 2002;105:804-809.

Effect of Interventions on Weight Change and Risk of Diabetes and Metabolic Syndrome

Diabetes Prevention Program



Risk of developing metabolic syndrome



LS = lifestyle intervention; MET = metformin; PB = placebo

Knowler WM, et al; Diabetes Prevention Program Research Group. *N Engl J Med*. 2002;346:393-403.

Orchard TJ, et al; Diabetes Prevention Program Research Group. *Ann Intern Med*. 2005;142:611-619.

Cardinal Behaviors of Successful Long-term Weight Management

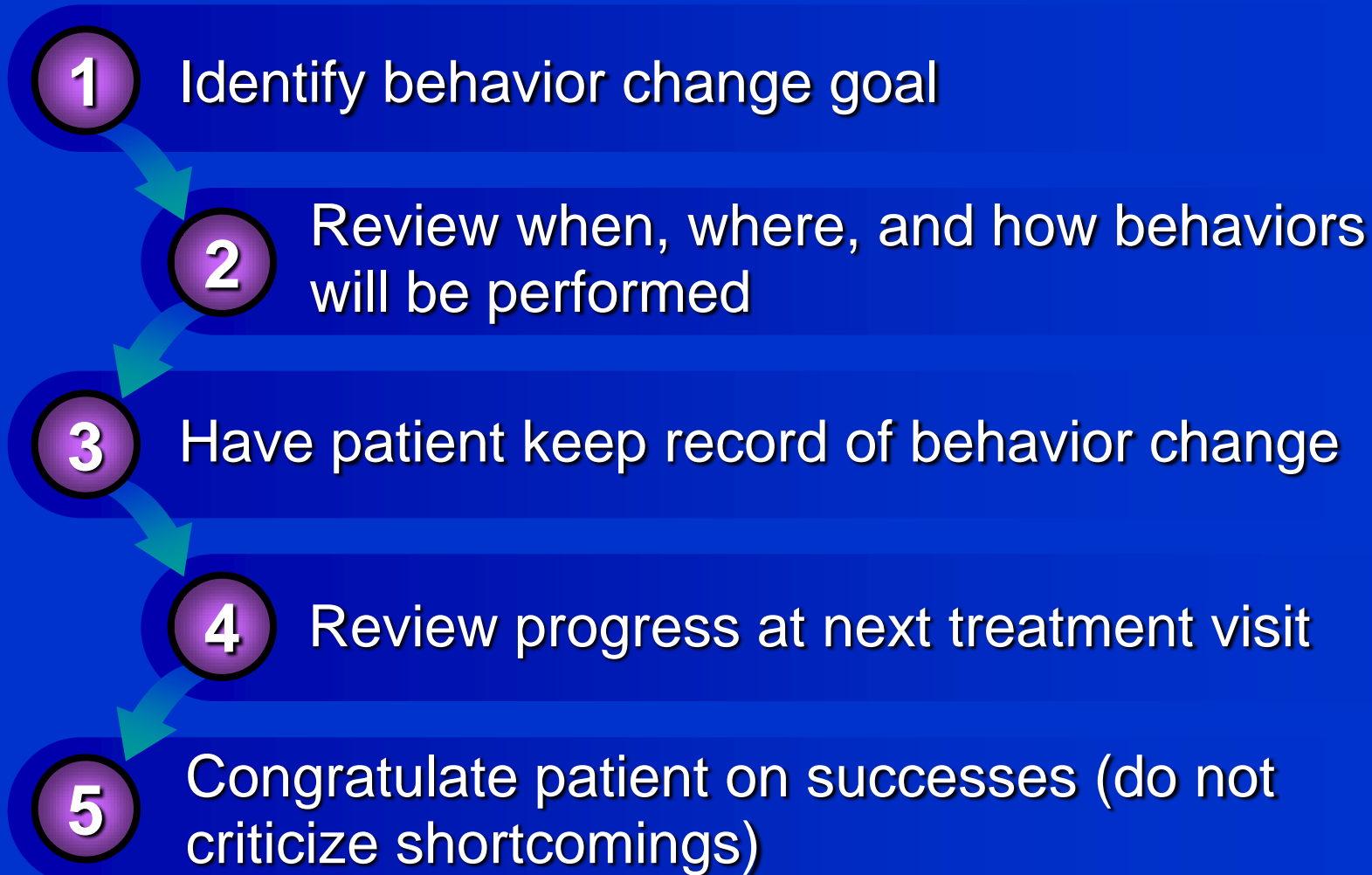
National Weight Control Registry Data

- **Self-monitoring:**
 - Diet: record food intake daily, limit certain foods or food quantity
 - Weight: check body weight ≥ 1 x/wk
- **Low-calorie, low-fat diet:**
 - Total energy intake: 1300-1400 kcal/d
 - Energy intake from fat: 20%-25%
- **Eat breakfast daily**
- **Regular physical activity:** 2500-3000 kcal/wk
(eg, walk 4 miles/d)

Klem et al. *Am J Clin Nutr* 1997;66:239.

McGuire et al. *Int J Obes Relat Metab Disord* 1998;22:572.

Five Steps to Facilitate Behavior Change



Self Monitoring: Food Diary

Time	Food	Amount	Place	Calories	Mood
9:15 am	Coffee	1 cup	Bedroom	0	Neutral
12:15 pm	Bagel	1 whole	Car	250	Rushed
12:15 pm	Cream cheese	1 oz	Car	100	Rushed
12:15 pm	Coffee	1 cup	Car	0	Rushed
3:30 pm	Oreo cookies	12	Den	640	Stressed
6:30 pm	Fried chicken	3 oz	Kitchen	435	Neutral
6:30 pm	Juice	8 oz	Kitchen	120	Neutral
6:30 pm	Roll w/butter		Kitchen	125	Neutral
6:30 pm	Mashed potatoes	½ cup	Kitchen	170	Neutral
8:30 pm	Yogurt	1 cup	Kitchen	100	Bored
8:30 pm	Apple	1 large	Kitchen	140	Bored
Total for the Day				2080	

Summary of Randomized Clinical Trials* of Behavioral Therapy for Weight Loss

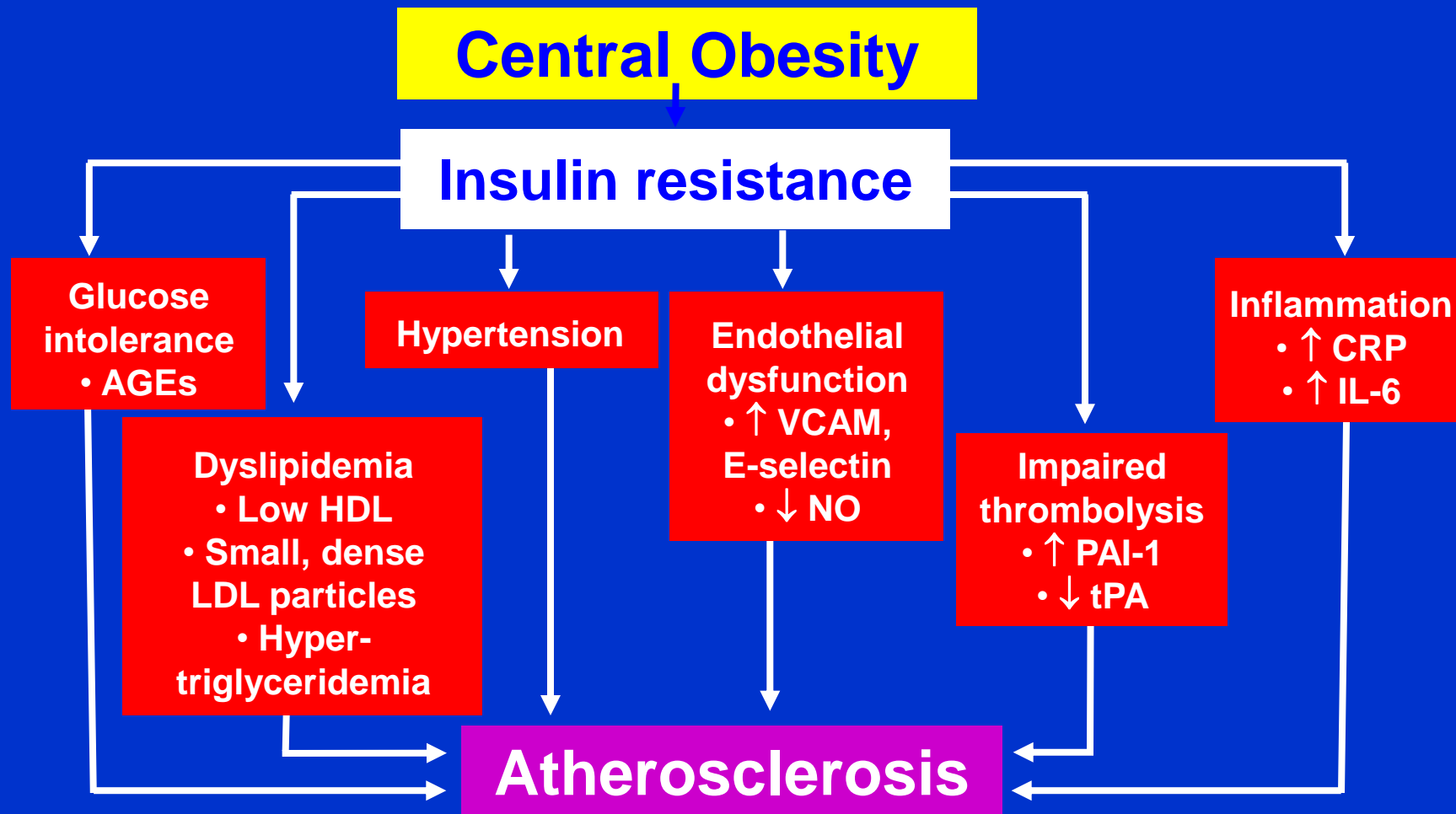
	1974	1984	1990-95	1996-99
Number of trials	15	15	14	9
Treatment duration (wk)	8	13	26	21
Rate of weight loss (kg/wk)	0.5	0.5	0.4	0.5
Weight loss (kg)	3.8	6.9	9.0	9.6
Length of follow-up (wk)	6	58	40	74
Weight loss at follow-up (kg)	4.0	4.4	5.2	6.0

*Published in 4 journals: *Addictive Behaviors*, *Behavior Therapy*, *Behaviour Research and Therapy*, and *Journal of Consulting and Clinical Psychology*

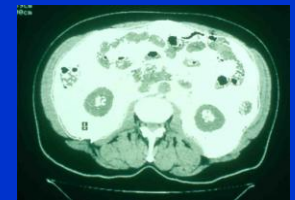
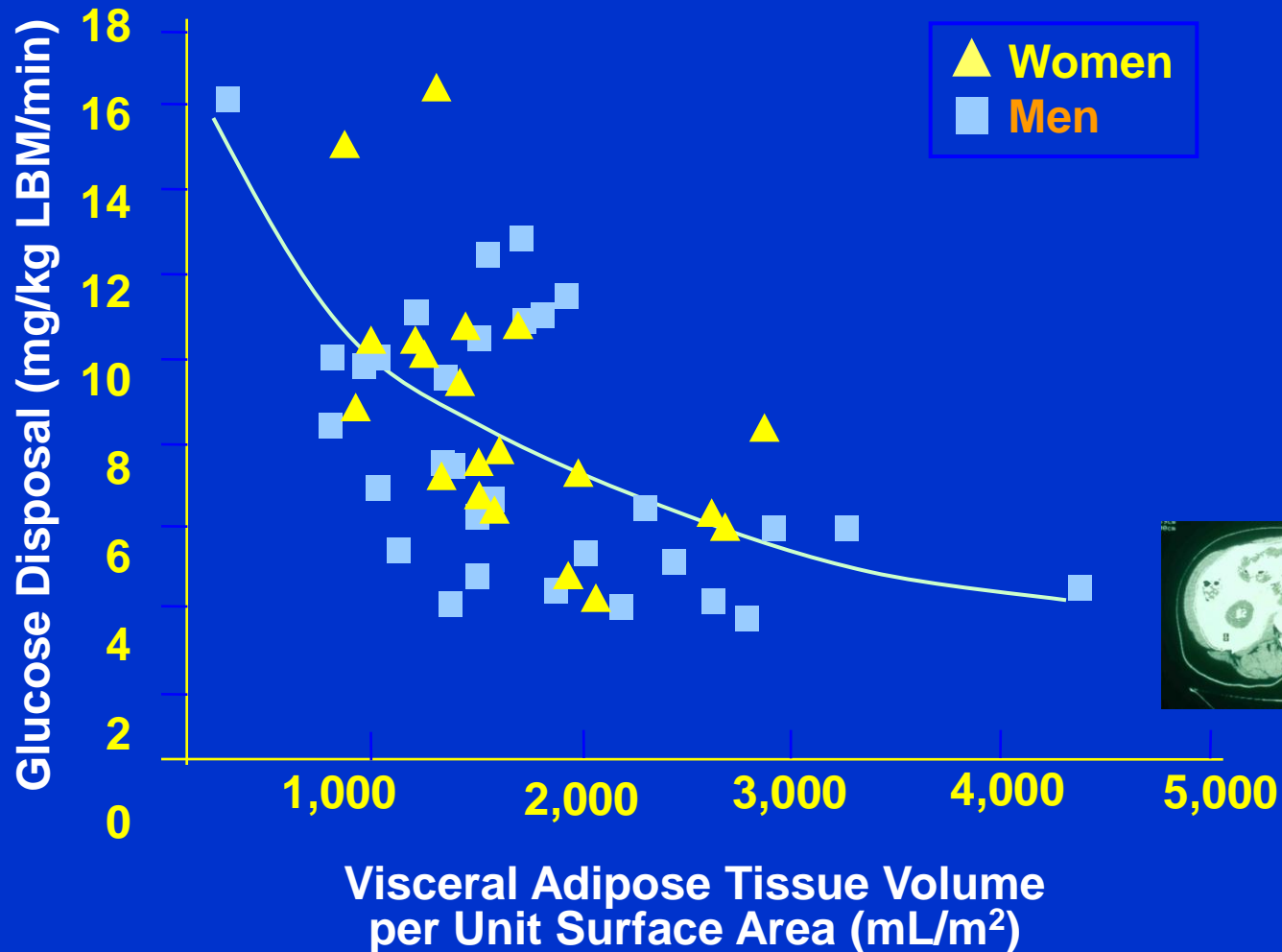
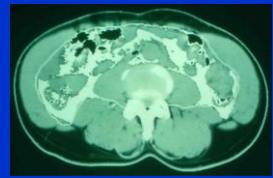
Adapted from Wadden and Foster. *Med Clin North Am* 2000;84:441.



Association of Insulin Resistance With Cardiovascular Risk Factors and Atherosclerosis



Relationship Between Visceral Adipose Tissue and Insulin Action



Measurement of Waist Circumference

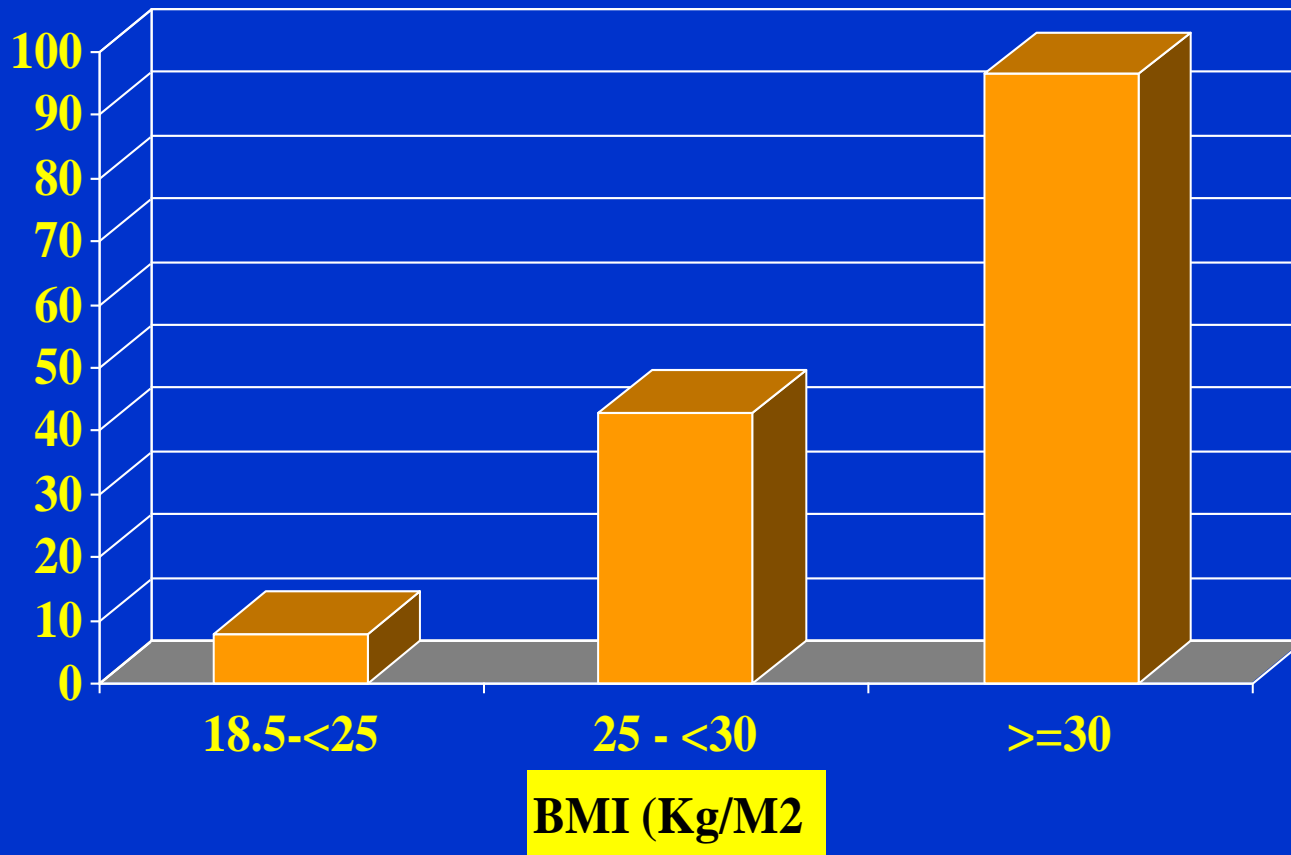


- Place a measuring tape, held parallel to the floor, around the patient's abdomen at the level of the iliac crest
- The tape should fit snugly around the waist without compressing the skin
- Take the measurement at the end of a normal expiration

A waist circumference of ≥ 40 inches in men or ≥ 35 inches in women is diagnostic of abdominal obesity and suggests the presence of other cardiometabolic risk factors.

Adapted from Grundy SM, et al. *Circulation*. 2005;112:2735-2752.

Percentage with high-risk waist circumference



Intra-Abdominal Fat Mass and CHD Risk in Type 2 Diabetes

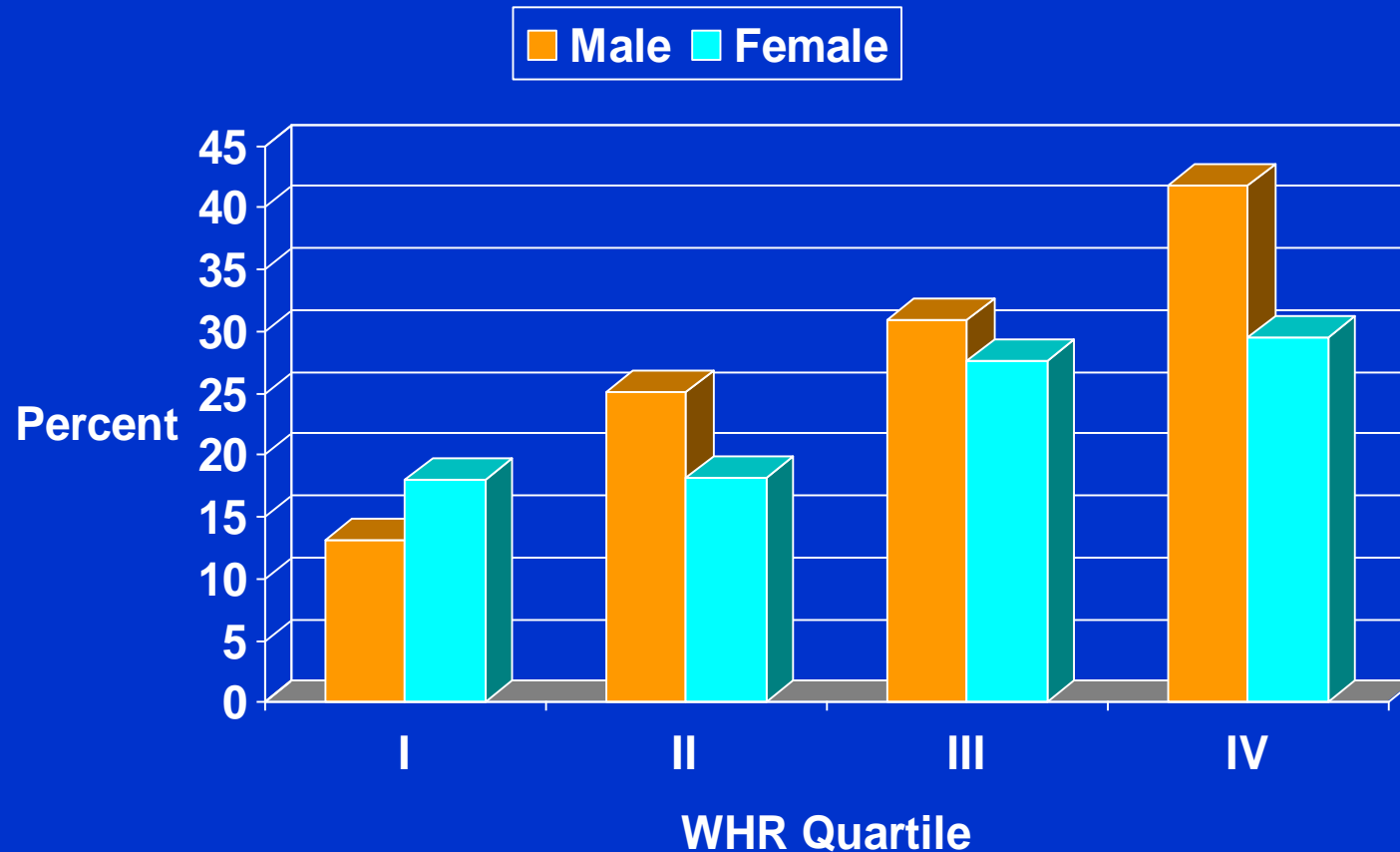
Quintile	Waist Circumference (in)	Relative Risk for CHD
1	15.0 to <27.5	1.0
2	27.5 to <29.2	1.27
3	29.2 to <31.2	2.08
4	31.2 to <34.0	2.31
5	34.0 to <54.7	2.44

Adjusted for BMI, age (continuous), age², smoking, parental history of myocardial infarction, alcohol consumption, physical activity, menopausal status, hormone replacement therapy, aspirin intake, saturated fat, and antioxidant score.

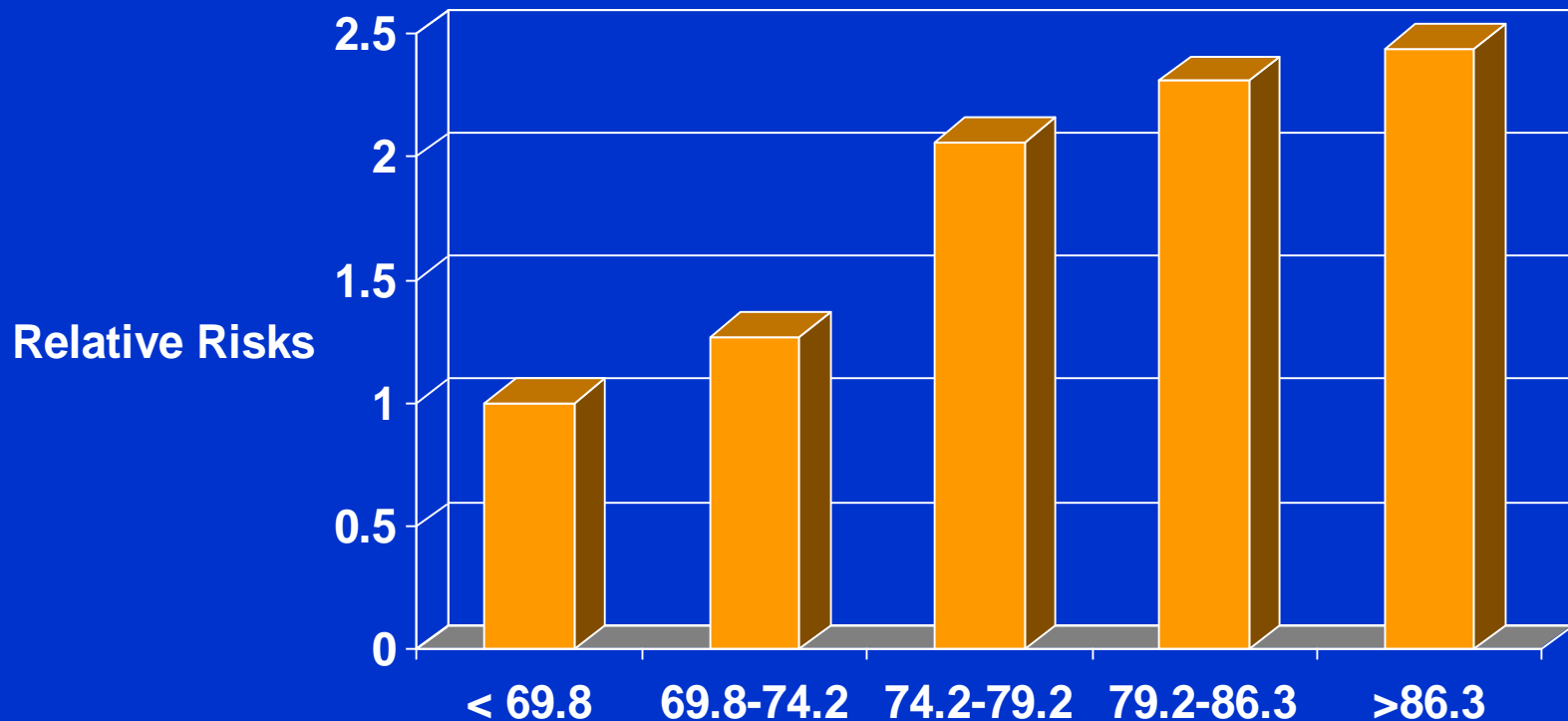
$P < 0.001$ for trend.

Rexrode W et al. *JAMA*. 1998;280:1843-1848.

Age-Adjusted Prevalence of hypertension by Waist-Hip Ratio

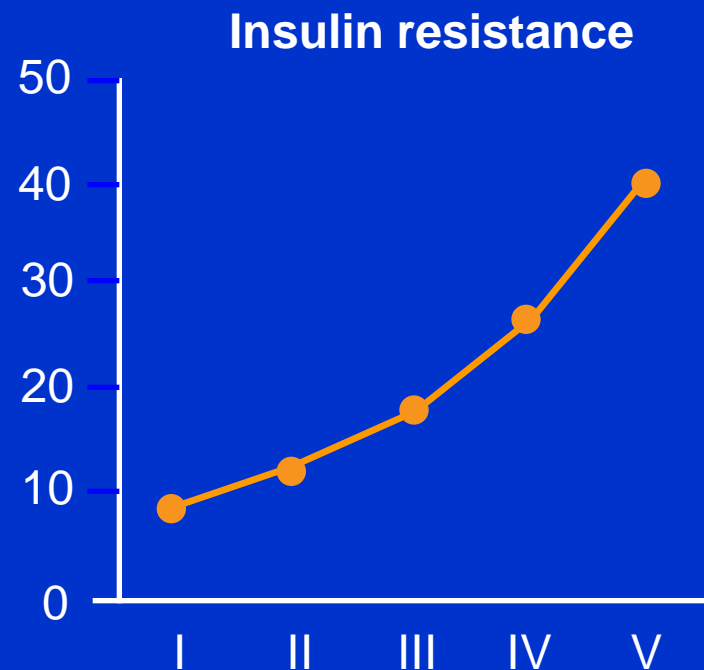
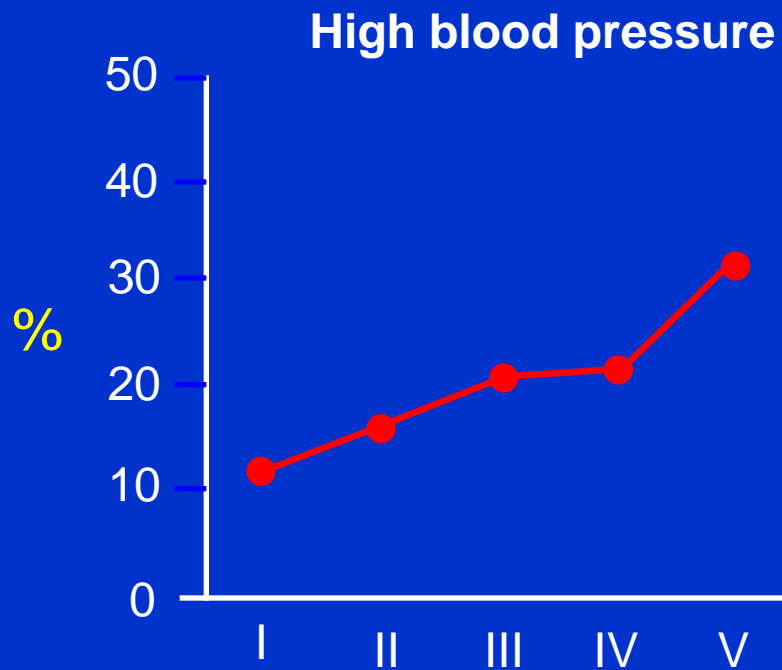


Relative Risks for Coronary Heart Disease by Waist Circumference



Waist Circumference Correlates With BP and Insulin Resistance

768 men with fasting glucose ≤ 126 mg/dL (≤ 7 mmol/L)



Quintiles of Waist Circumference

$P < .001$ for trend in each parameter.

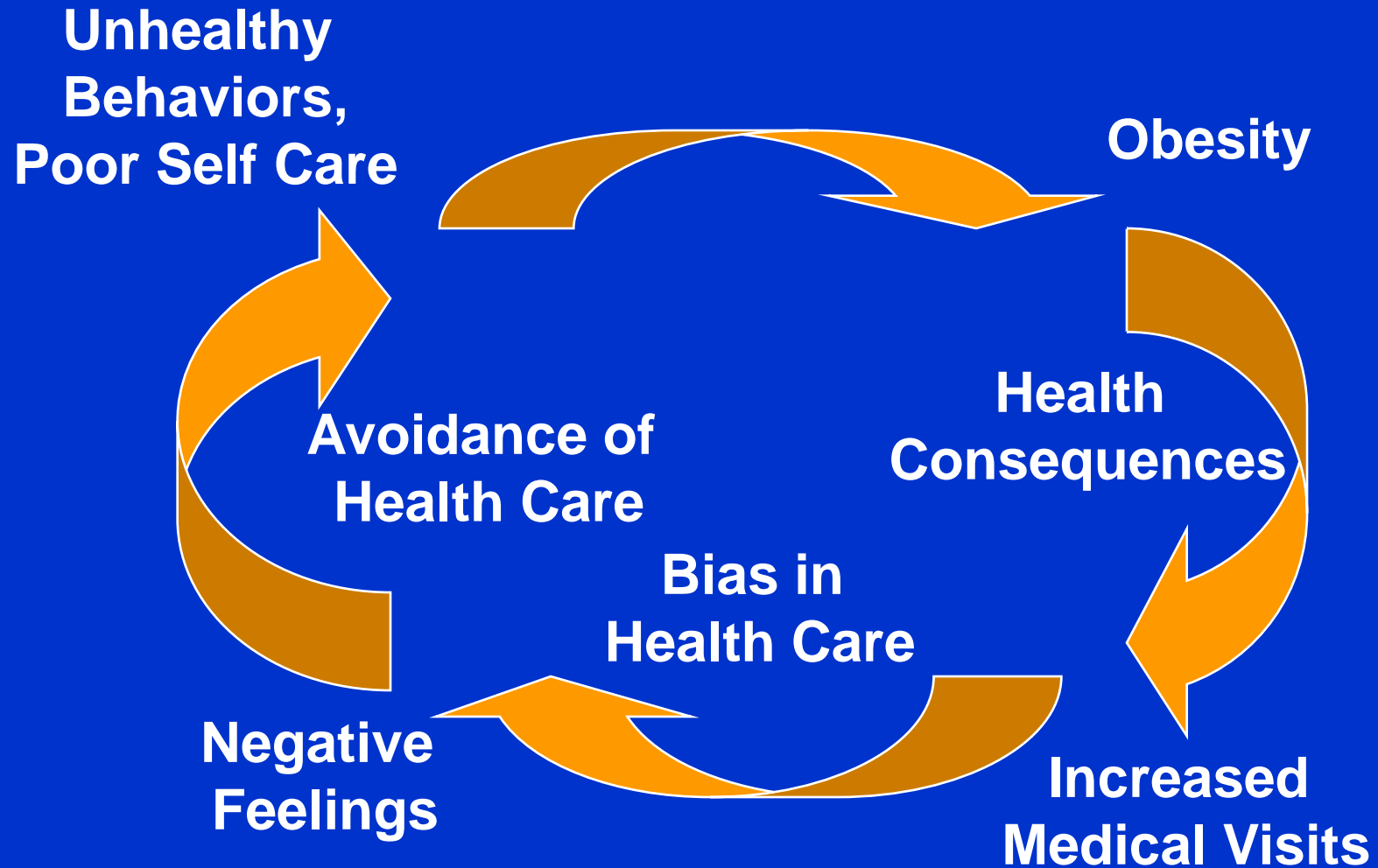
Changes in Weight and Blood pressure after 2 months (Intent to treat analyses)

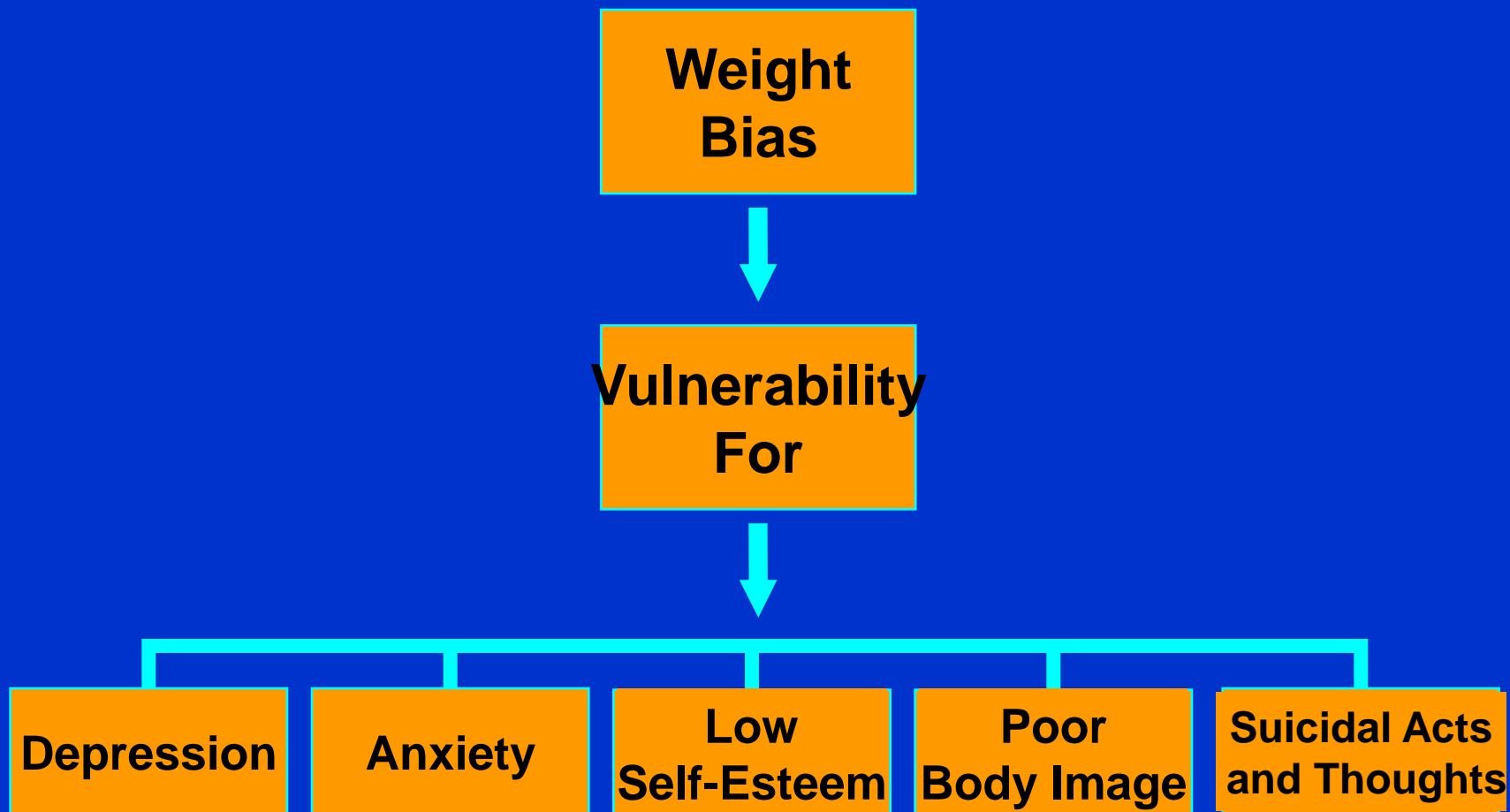
Parameter	Atkins	Zone	Weight Watchers	Ornish
Weight kg	-3.6	-3.8	-3.5	-3.6
BMI	-1.3	-1.3	-1.2	-1.2
Waist circumference cm	-3.3	-3.0	-3.5	-2.7
Systolic blood pressure mmHg	-4.2	-4.1	-4.8	-1.3

Impact on Care

- Obese patients are less likely to obtain...
 - Preventive health services and exams
 - Cancer screens, pelvic exams, mammograms
- ...and are more likely to...
 - Cancel appointments
 - Delay appointments

Cycle of Bias and Obesity

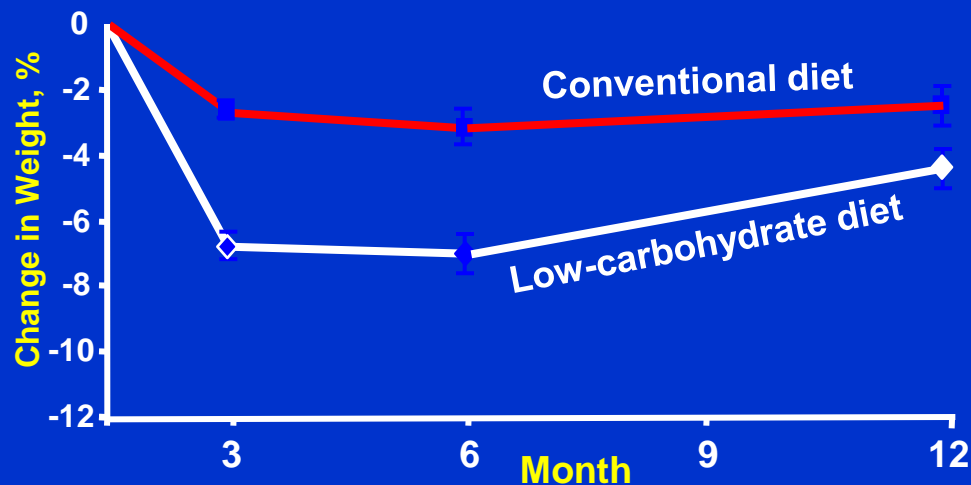




Cattarin & Thompson, 1994; Eisenberg et al., 2003; Haines, Neumark-Sztainer, Eisenberg, & Hannan, 2006; Hayden-Wade et al., 2005; Lunner et al., 2000; Neumark-Sztainer et al., 2002; Shroff & Thompson, 2004; Thompson et al., 1995; van den Berg et al., 2002; Young-Hyman et al., 2003

Comparison of Effects of Low-Carbohydrate and Conventional Diets

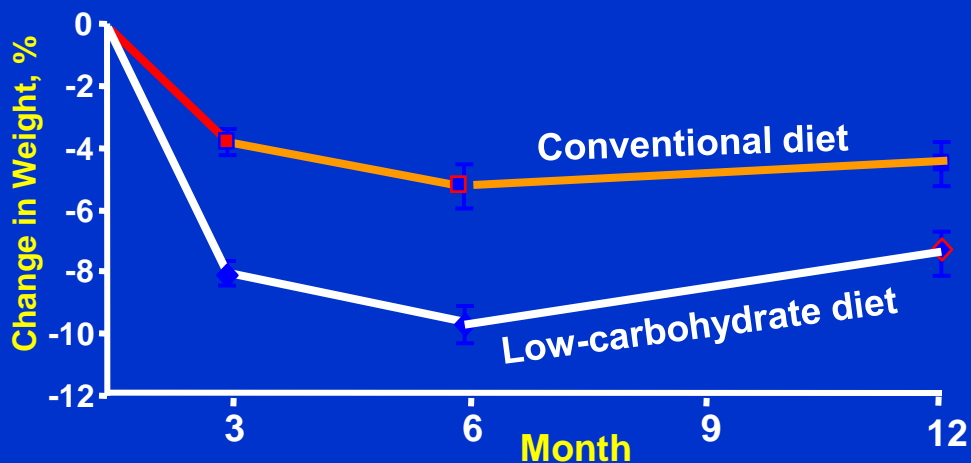
Baseline Values Carried Forward



- Weight loss from low-carbohydrate diet not sustained at 1 year
- Poor adherence and high attrition both with low-carbohydrate and conventional (low-calorie, high-carbohydrate) diet
- Other studies show 75%-121% of weight is regained over time*

*Glazer G. *Ann Intern Med.* 2001;161:1814-1824.

Complete Data or Data From Last Visit





1300

TOTAL Calories
2250

\$7.41



650

24 oz. Beverage
300

Benefit of Lifestyle Modifications in Hypertension Management

	<u>Bp Effect</u>
DASH Diet	8-14 mmHg
Weight Loss	10Kg- 5- 20mmHg
Low Sodium Diet	2-8 mmHg
Reduce Alcohol Intake	2-4 mmHg
Regular Exercise	4-9 mmHg

'Women sprinkling salt on their husbands to stimulate their sexual performance'



Sodium and Potassium

2/3 LB** Double Bacon Cheese Thickburger

Serving size (grams) = 462

Calories = 1300

Sodium = 2110 mg

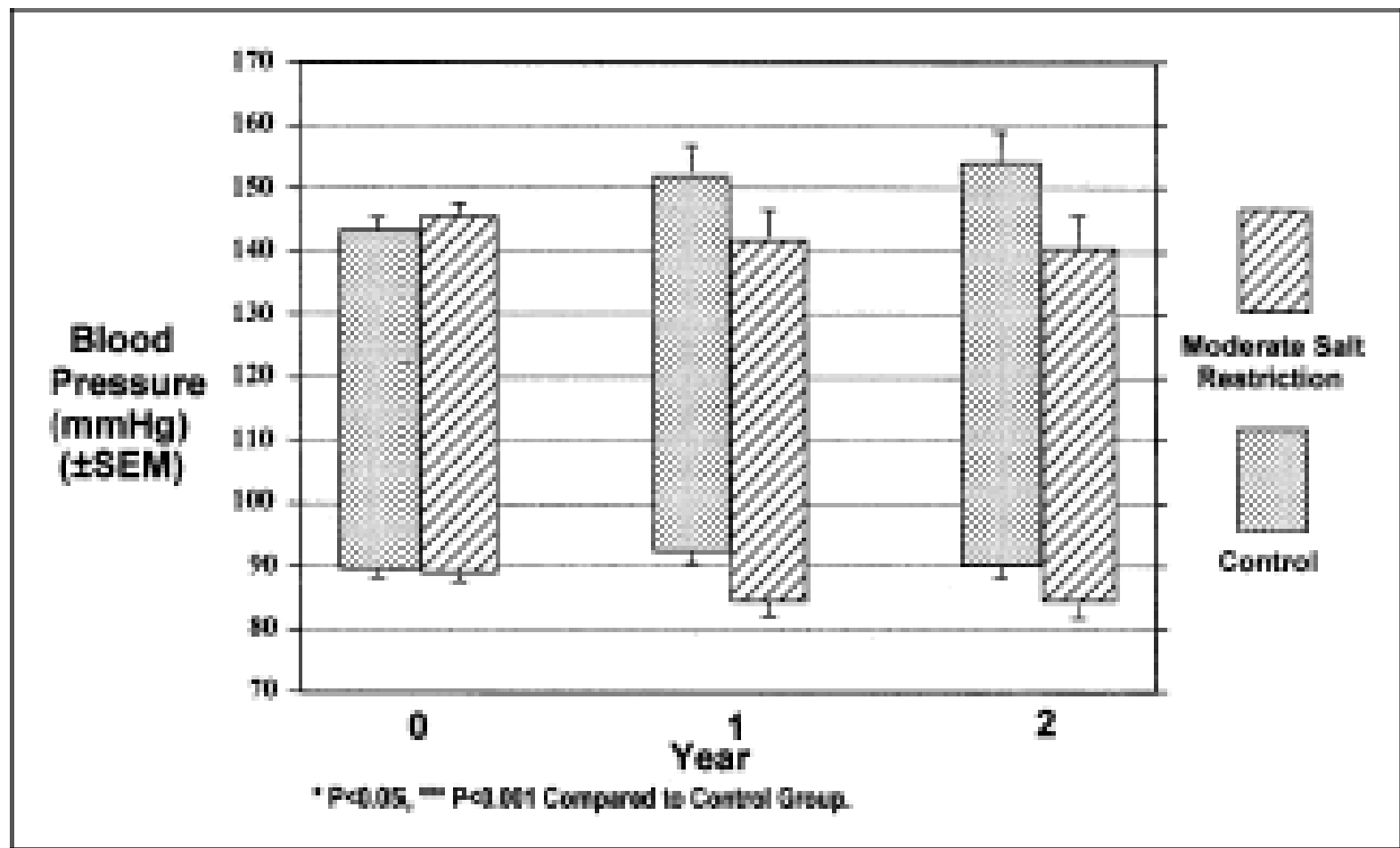


Sodium and cardiovascular disease

- Prospective follow-up of 2400 Finnish men and women
- 100 mmol/d higher sodium excretion associated with 45% increase in cardiovascular death and 26% in all-cause mortality

Tuomilehto, Lancet 357:848, 2001

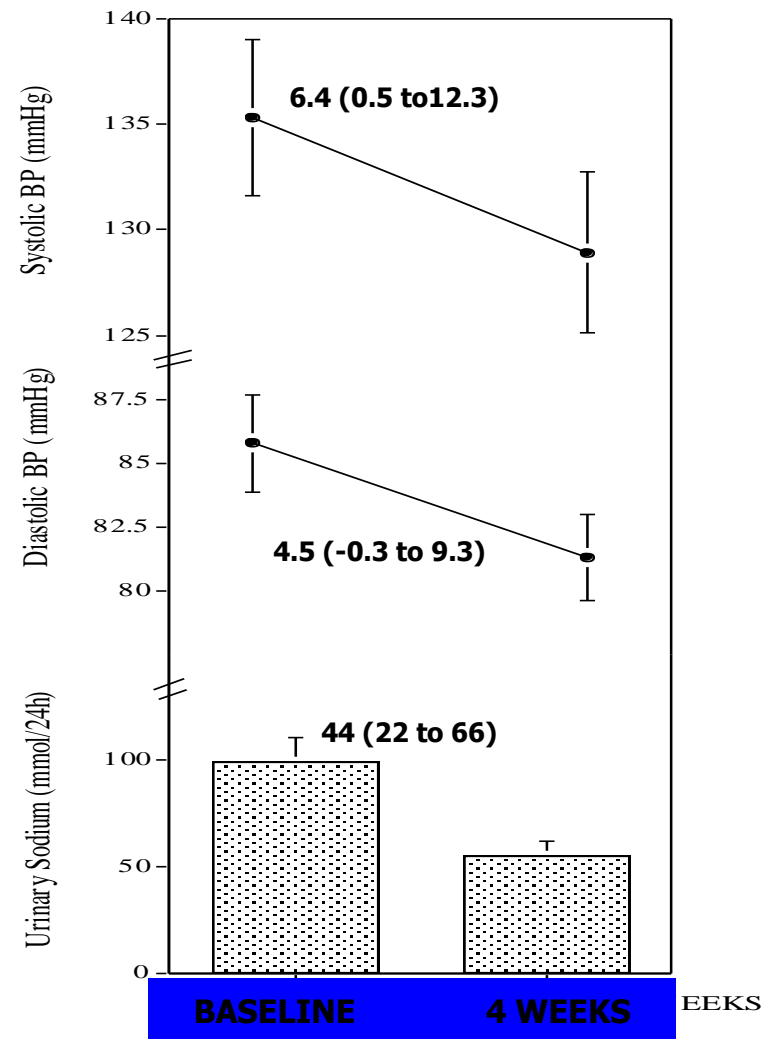
Figure 5. Blood pressure changes in two Portuguese villages



Forte-J Human Hypertension 1989

Community dietary salt reduction in Kumasi

Cappuccio FP et al. Lancet 2000;356:677-8

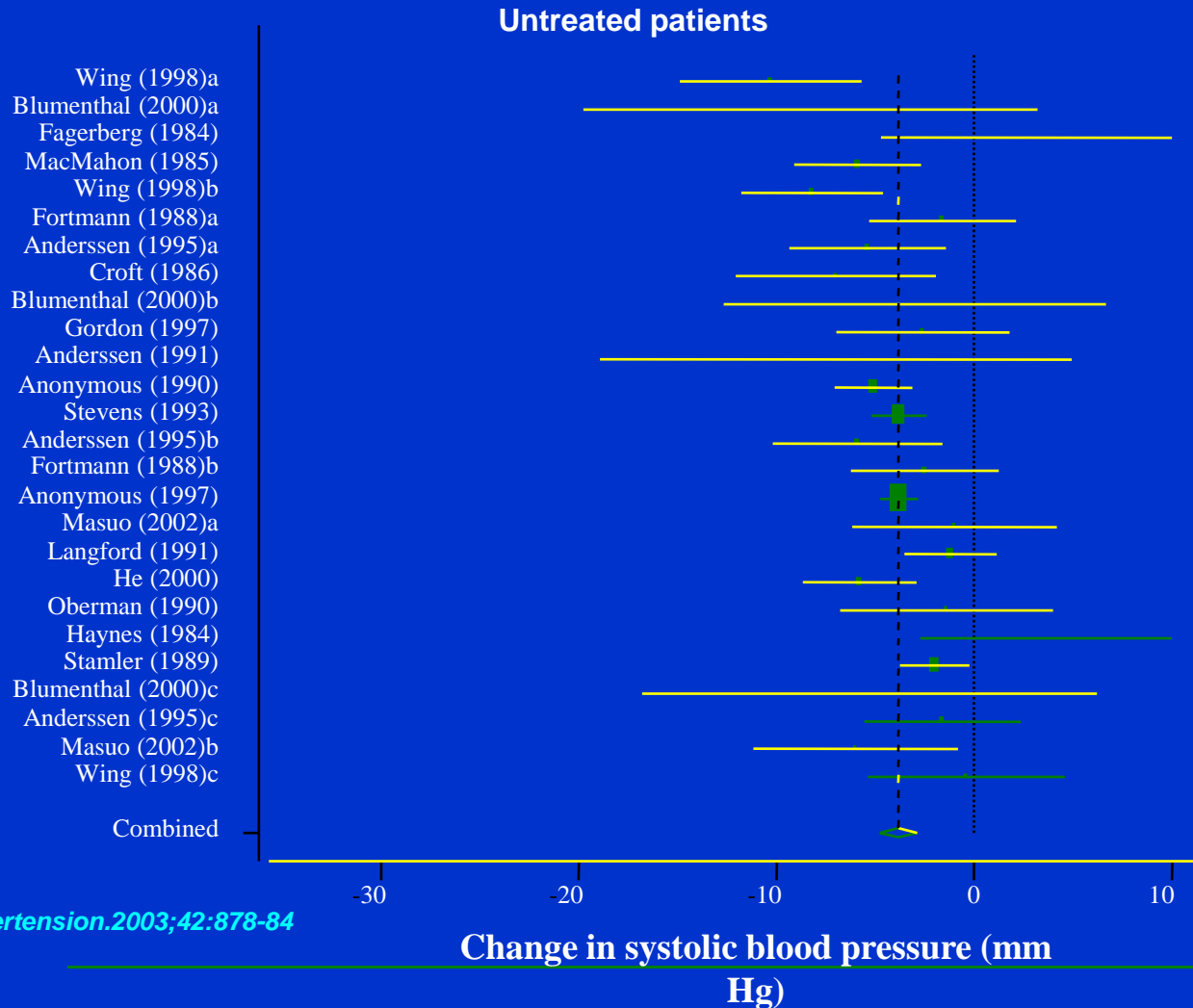


20 farmers

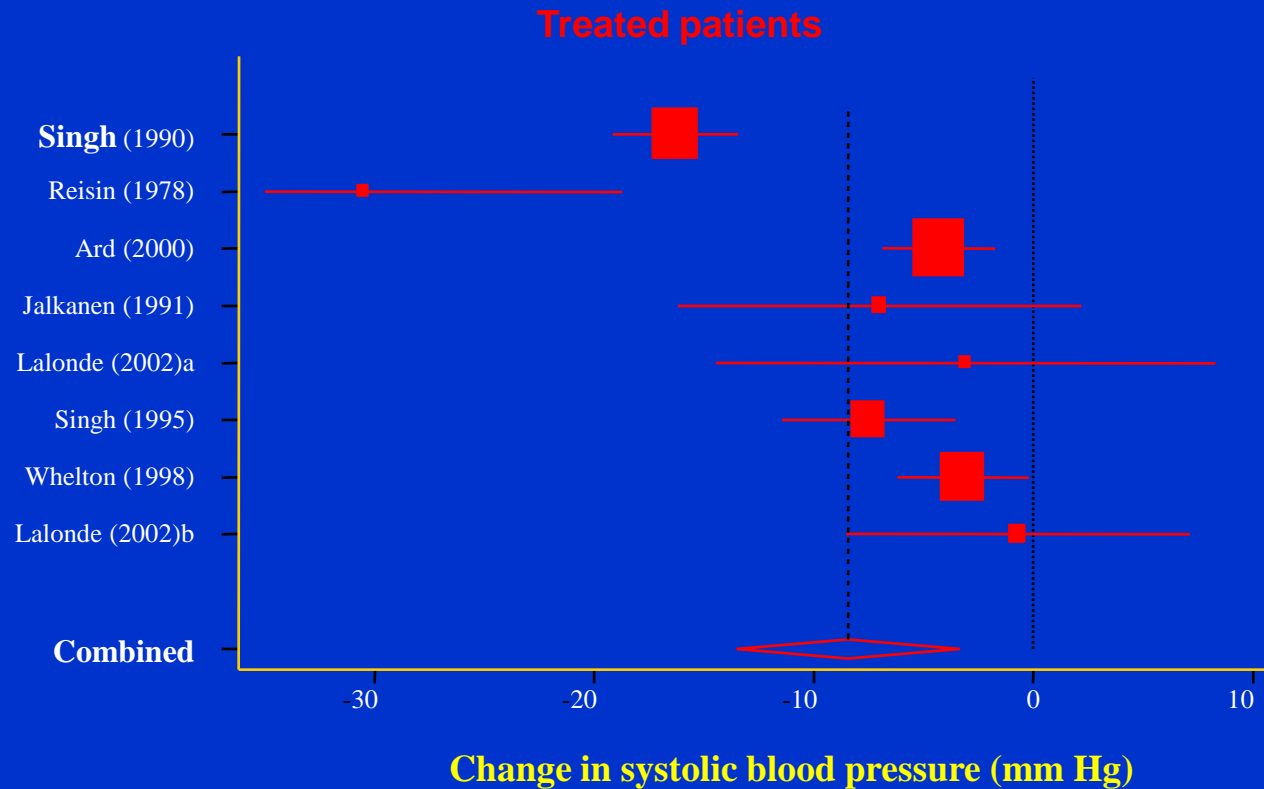
Sodium Intervention

- $\frac{3}{4}$ of the dietary sodium intake is due to processed foods

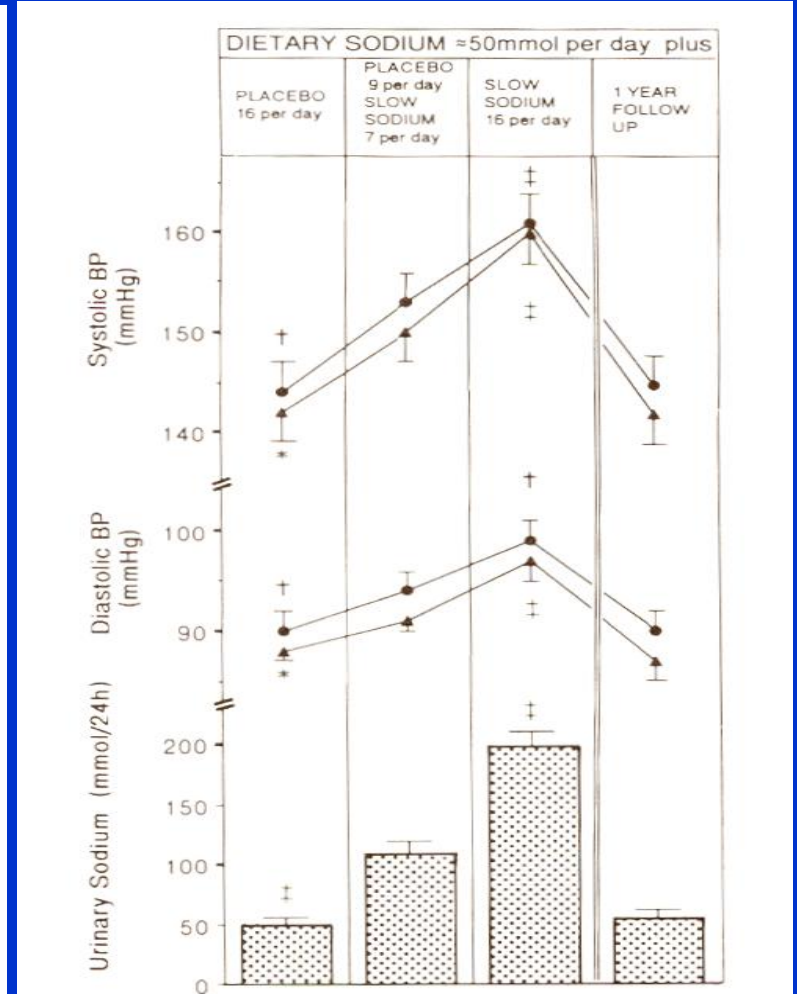
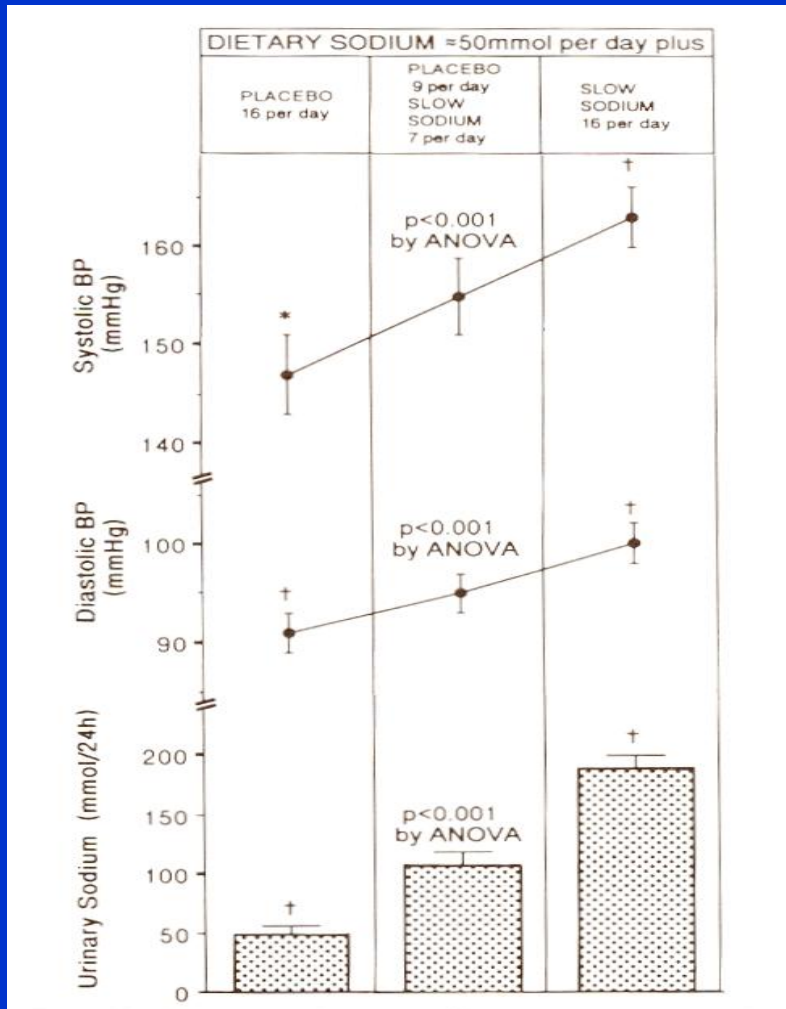
Systolic blood pressure change in randomized controlled trials of weight reduction in function of whether or not the patients follow an antihypertensive treatment.



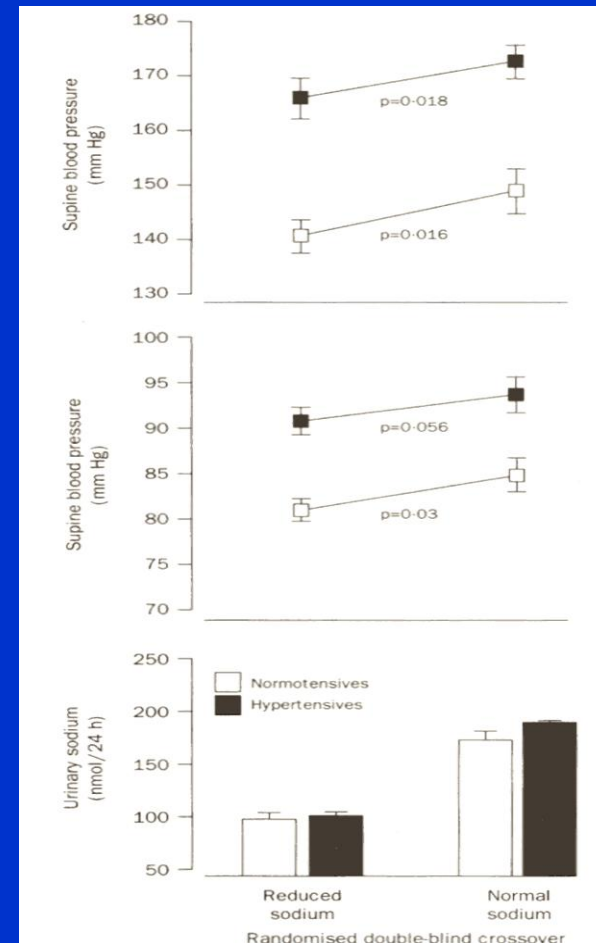
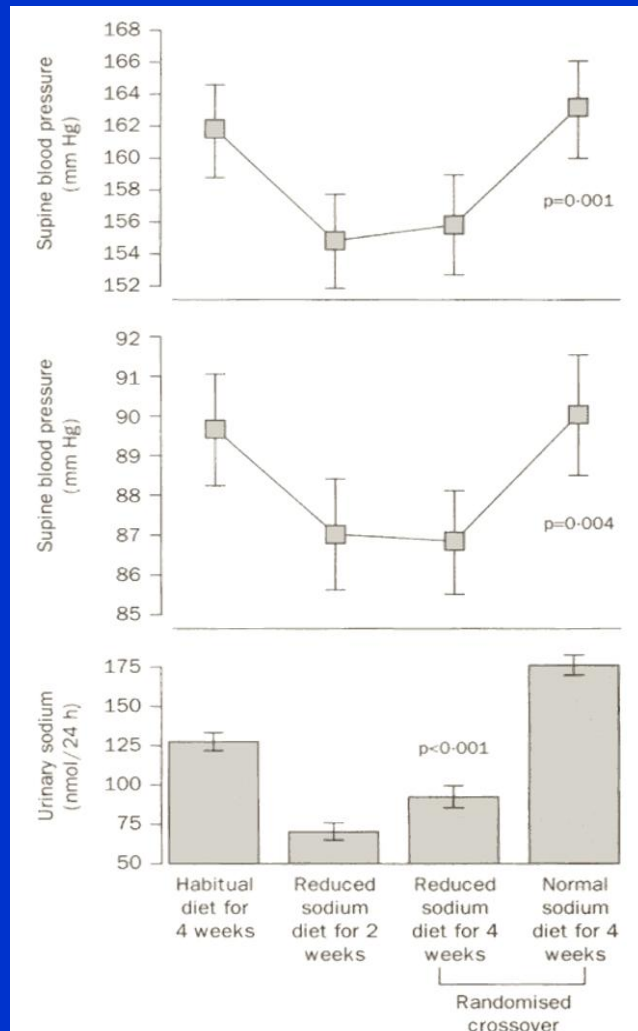
Systolic blood pressure change in randomised controlled trials of weight reduction in function of whether or not the patients follow an antihypertensive treatment.



DOUBLE-BLIND STUDY OF THREE SODIUM INTAKES AND LONG-TERM EFFECTS OF SODIUM RESTRICTION IN ESSENTIAL HYPERTENSION

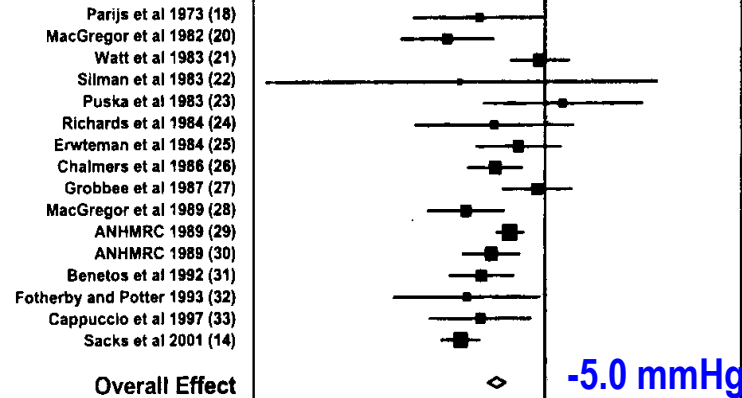


Modest salt restriction in older people

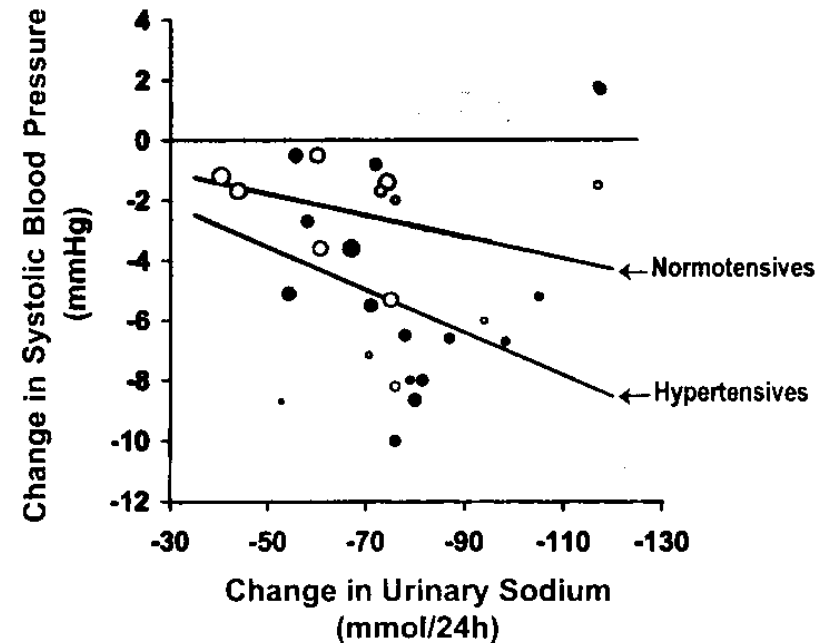
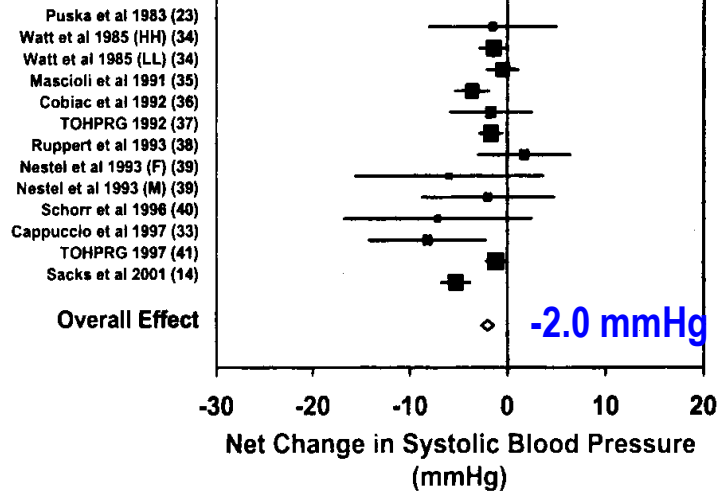


Dietary Sodium Reduction and Blood Pressure

Hypertensive

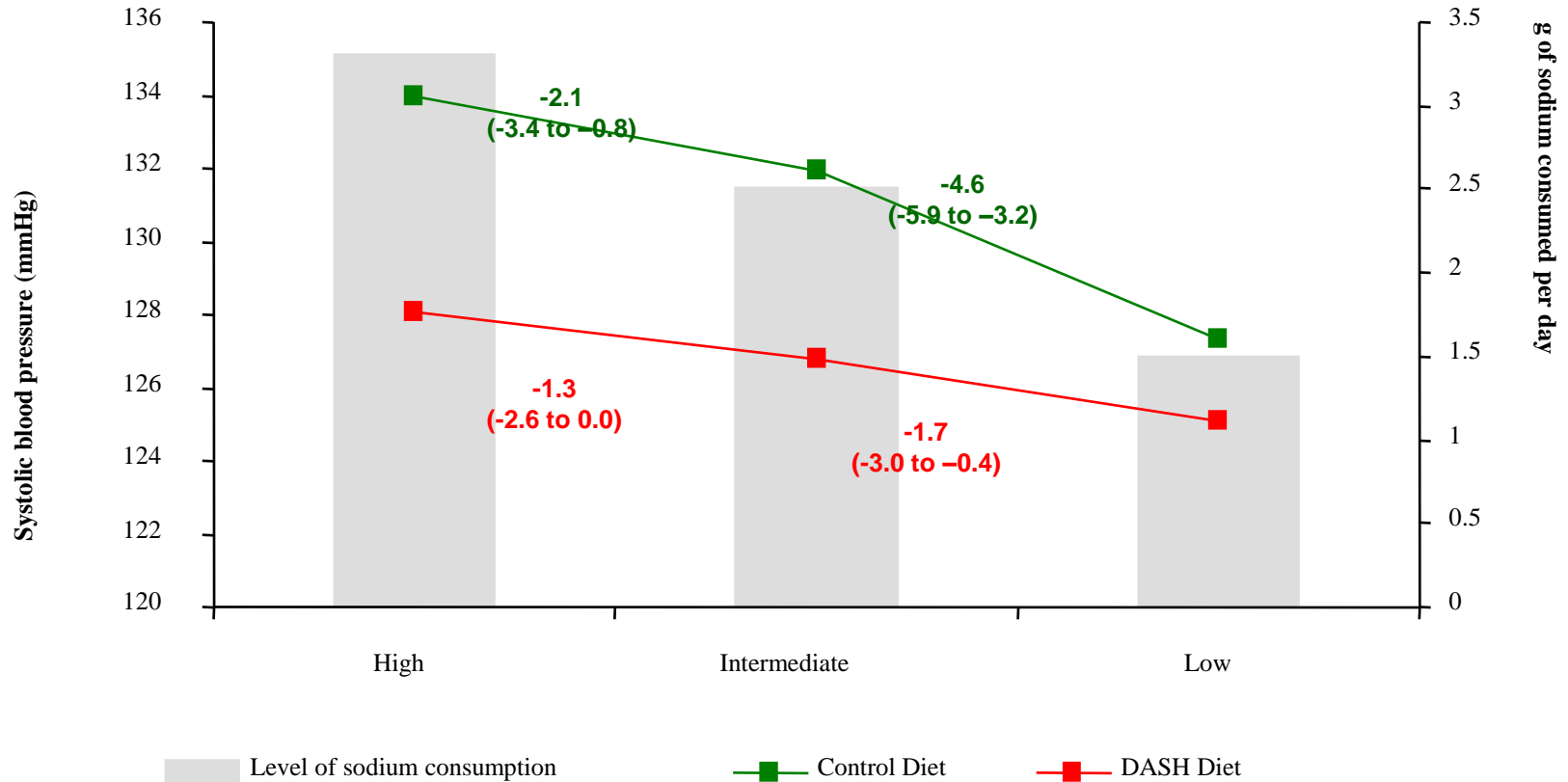


Normotensive



*17 trials in hypertensives (n=734)
11 trials in normotensives (n=2,220)
≥4 wks duration
Reduction in sodium ~80 mmol/day*

Systolic blood pressure reduction following the DASH diet and a reduction of salt intake



The reduction in salt consumption is a valuable non pharmacological measure to reduce blood pressure; its combination with the DASH diet is additive.

Mean net changes in SBP and DBP

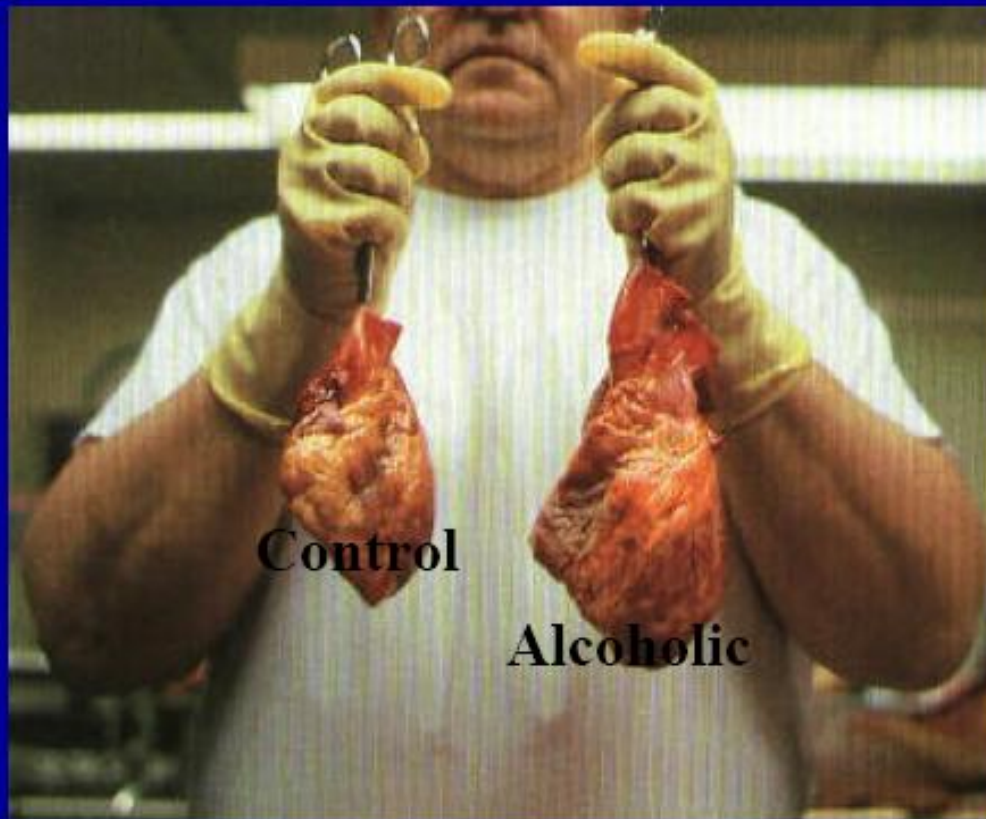
Variable	Systolic Blood Pressure			Diastolic Blood Pressure		
	Trials Examined	Net Change (95% CI)	P Value	Trials Examined	Net Change (95% CI)	P Value
	<i>n</i>	<i>mm Hg</i>		<i>n</i>	<i>mm Hg</i>	
All trials	53	-3.84 (-4.97 to -2.72)	<0.001	50	-2.58 (-3.35 to -1.81)	<0.001
Exercise supervised*	45	-4.13 (-5.21 to -3.05)	<0.001	42	-2.68 (-3.55 to -1.81)	<0.001
Antihypertensive medication not administered†	49	-4.23 (-5.42 to -3.05)	<0.001	46	-2.91 (-3.69 to -2.13)	<0.001
Single intervention between groups‡	47	-4.39 (-5.68 to -3.10)	<0.001	44	-2.97 (-3.82 to -2.12)	<0.001
Blood pressure as primary outcome§	37	-4.39 (-5.93 to -2.86)	<0.001	36	-2.87 (-3.91 to -1.84)	<0.001

Whelton SP et al. *Ann Int Med* 2002;136:493-503

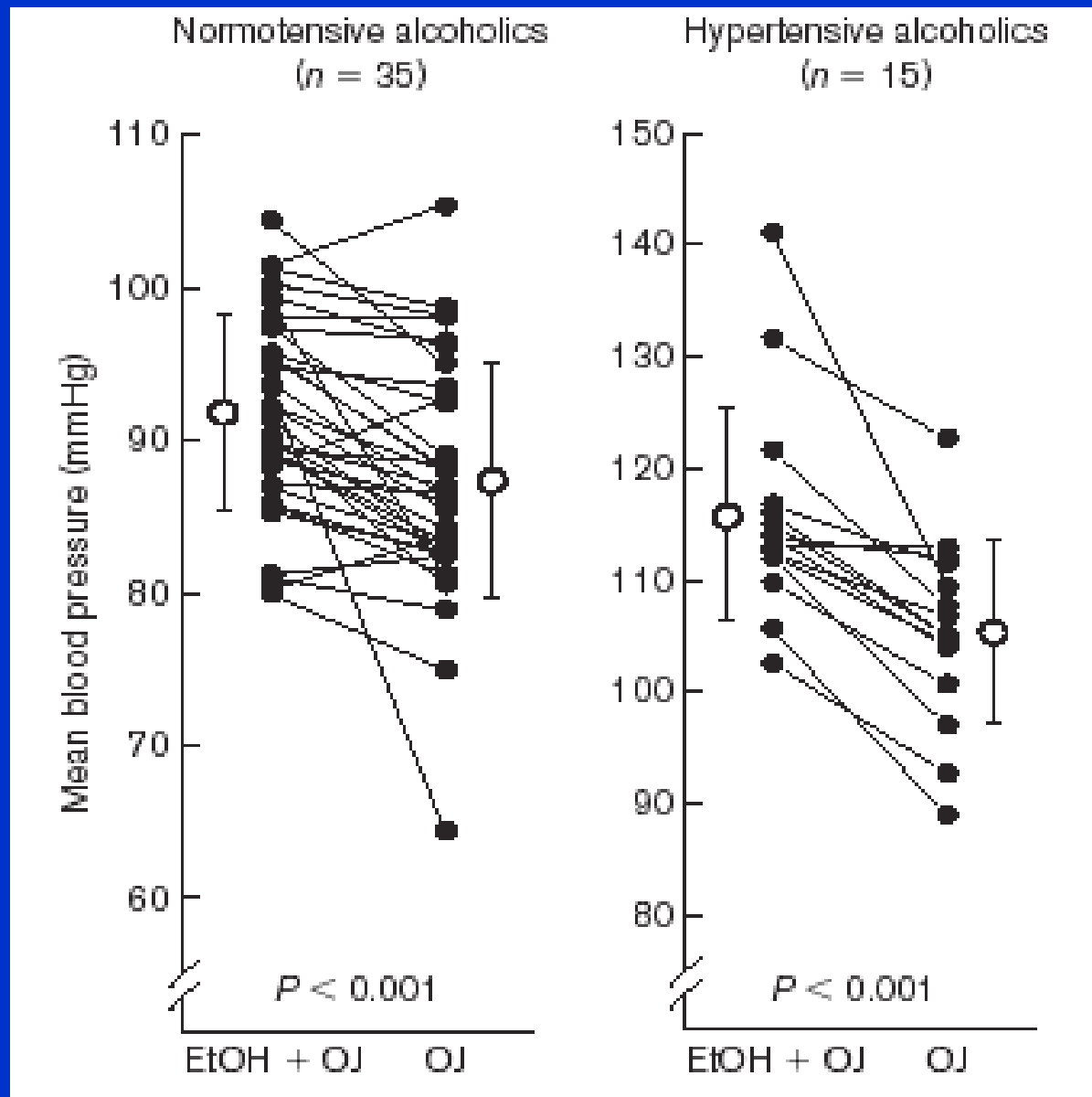
Benefit of Lifestyle Modifications in Hypertension Management

	<u>Bp Effect</u>
DASH Diet	8-14 mmHg
Weight Loss	10Kg- 5- 20mmHg
Low Sodium Diet	2-8 mmHg
Reduce Alcohol Intake	2-4 mmHg
Regular Exercise	4-9 mmHg

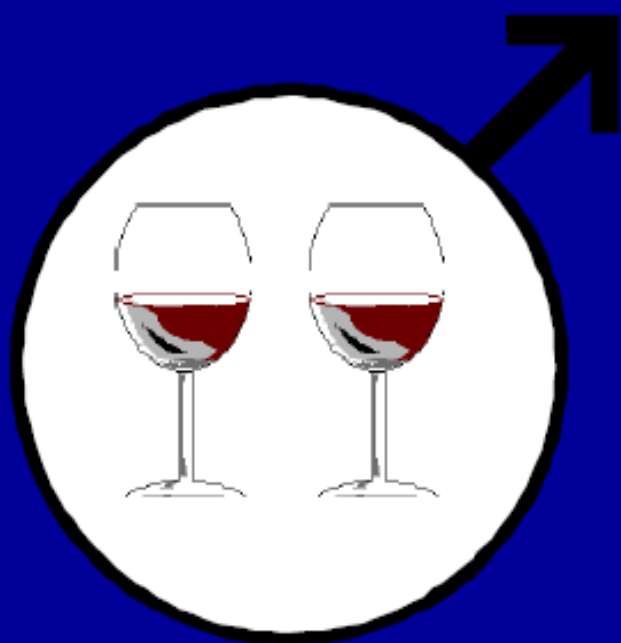
Alcoholic Cardiomyopathy



Picture Modified from National Geographic, 181:14, 1992

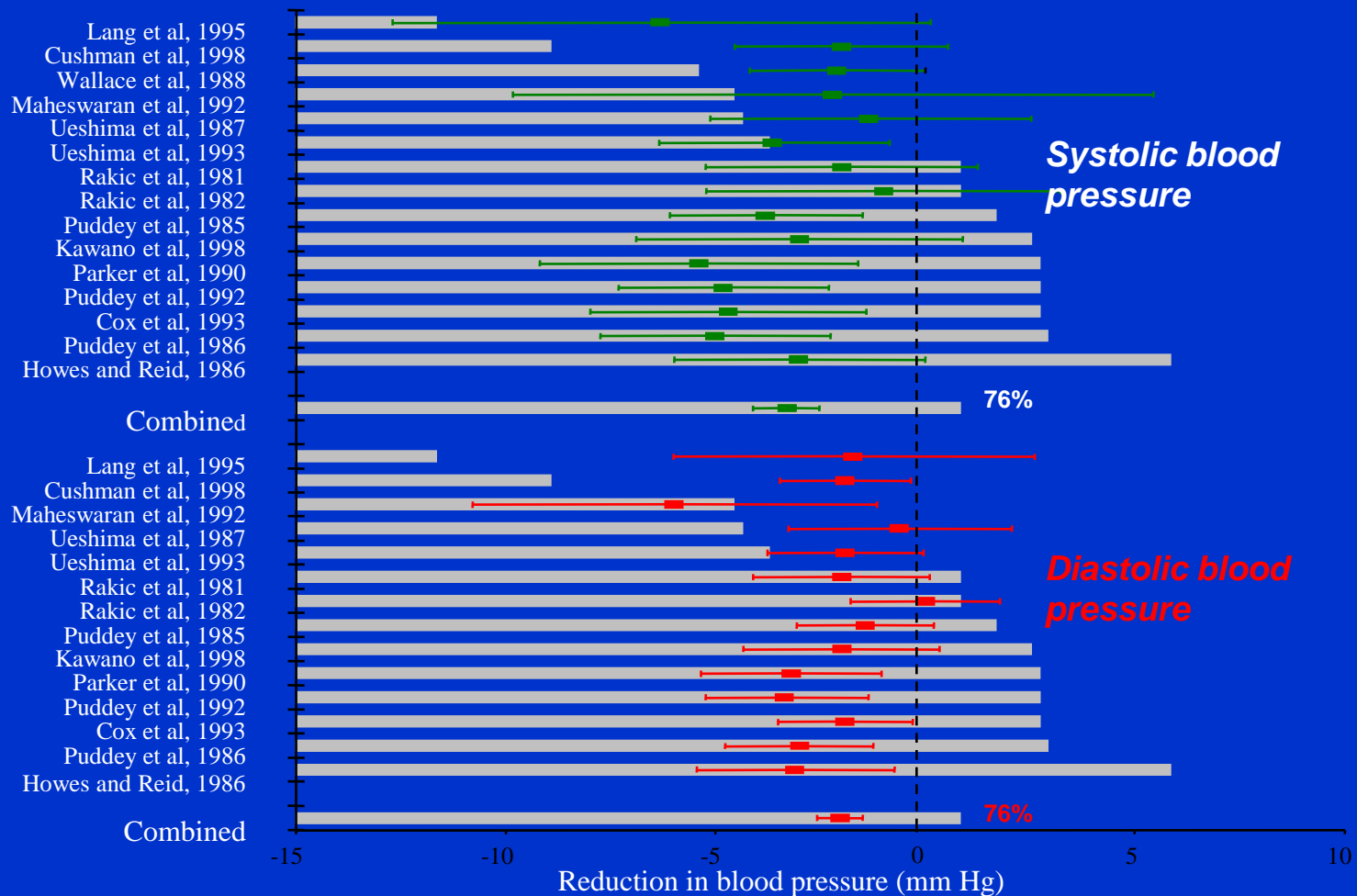


Moderate Drinking



**One Drink = 12 ounces of beer
5 ounces of wine, or
1.5 ounces of 80-proof distilled spirits**

Effect of alcohol reduction on systolic and diastolic blood pressure



There is a dose-response relation between the reduction in blood pressure following a reduction in alcohol intake.

Xin et al. Hypertension.2001;38:1112-7

Energy Content of Alcoholic Beverages

Alcohol contains 7 kcal/g

Beer	12 oz	160 calories
Wine	5 oz	100 calories
Margarita	8 oz	270 calories
Gin and Tonic	8 oz (contains 1.7 oz gin)	190 calories
1 shot of liquor	2 oz	128 calories

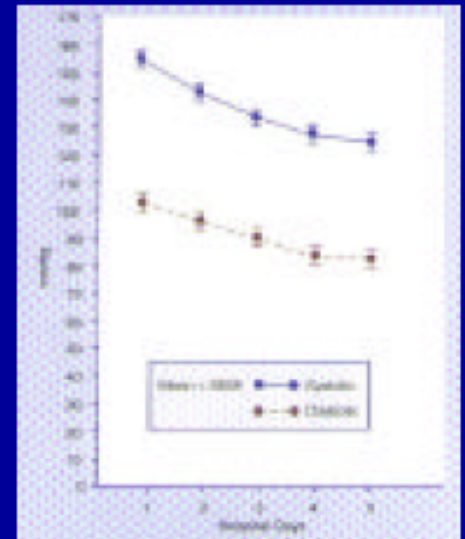
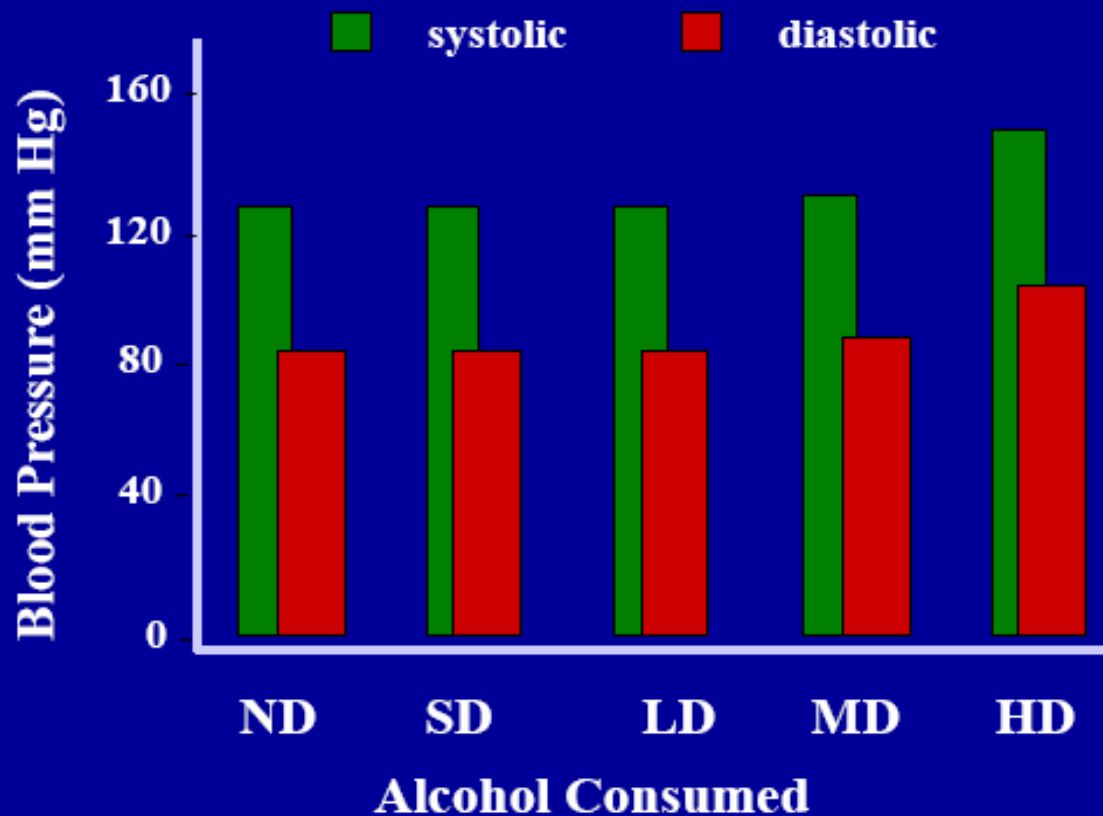


Alcohol intake

- > 210 g per week (18 drinks) was associated with increased hypertension rates in all four race-sex groups.
- .5-1 drink per week increased the risk of hypertension by 14% and 2 drinks per day increased the risk by 31%

Hypertension 37:1242, 2001; JCH 6:716, 2004

Chronic Heavy Alcohol Consumption Causes Hypertension

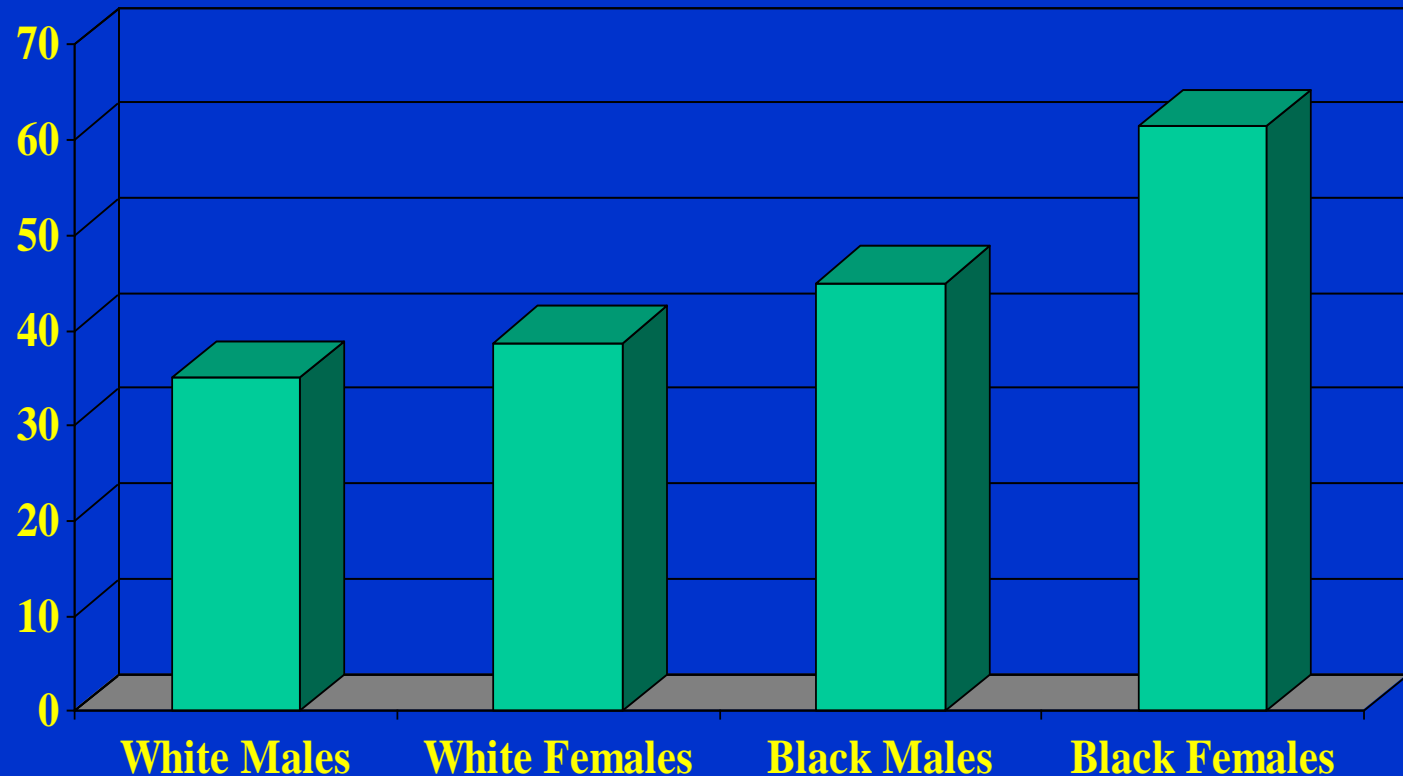


Hypertension, 19:79-84, 1992; Ueshima et al., *Hypertension*, 21:248-252, 1993

Benefit of Lifestyle Modifications in Hypertension Management

	<u>Bp Effect</u>
DASH Diet	8-14 mmHg
Weight Loss	10Kg- 5- 20mmHg
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Sedentary Lifestyle (< 60 minutes per week) SC Adults



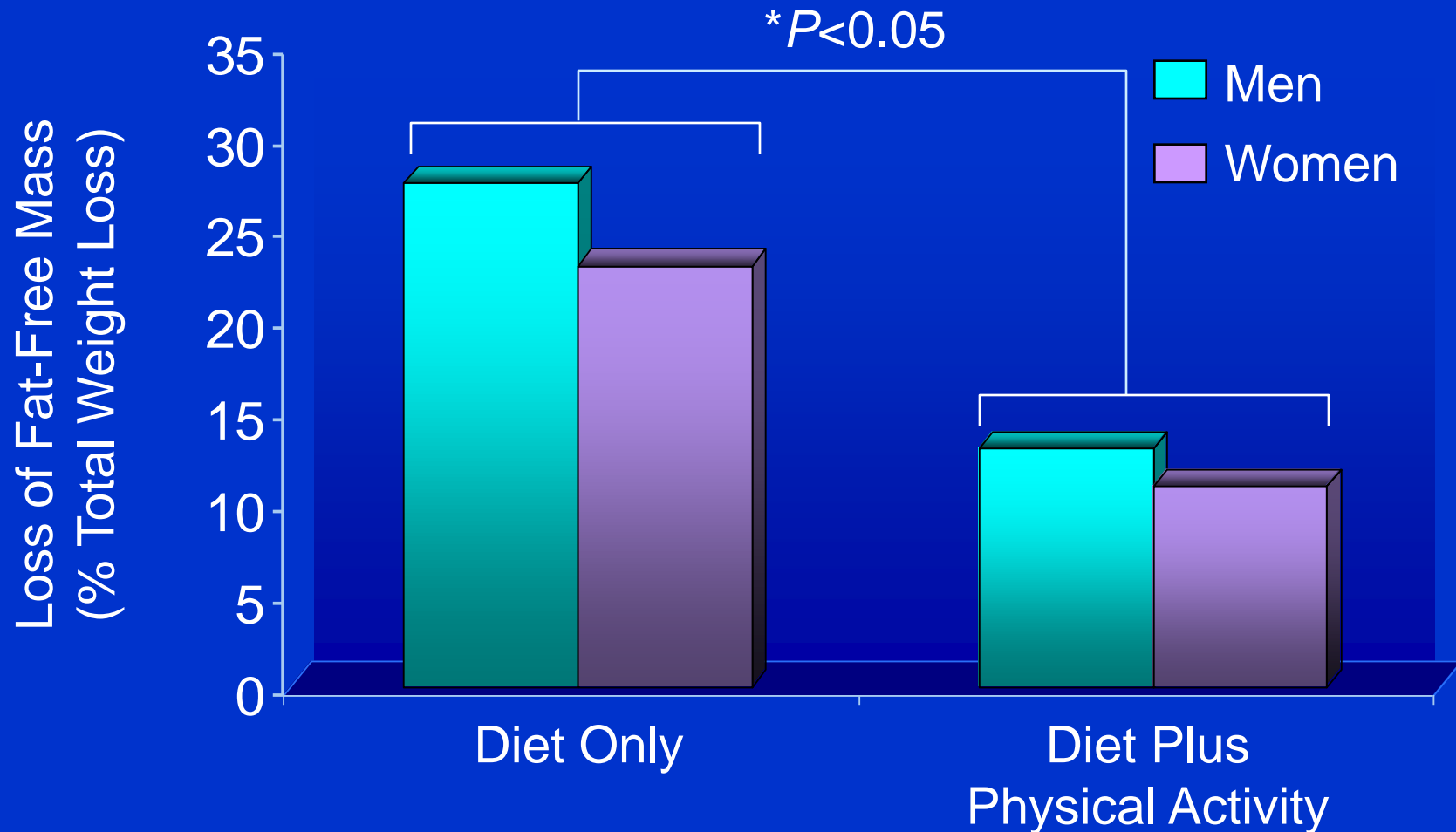
Lackland, 1992

Benefits of Regular Physical Activity in Obese Persons

- Decreases loss of fat-free mass associated with weight loss
- Improves maintenance of weight loss
- Improves cardiovascular and metabolic health, independent of weight loss

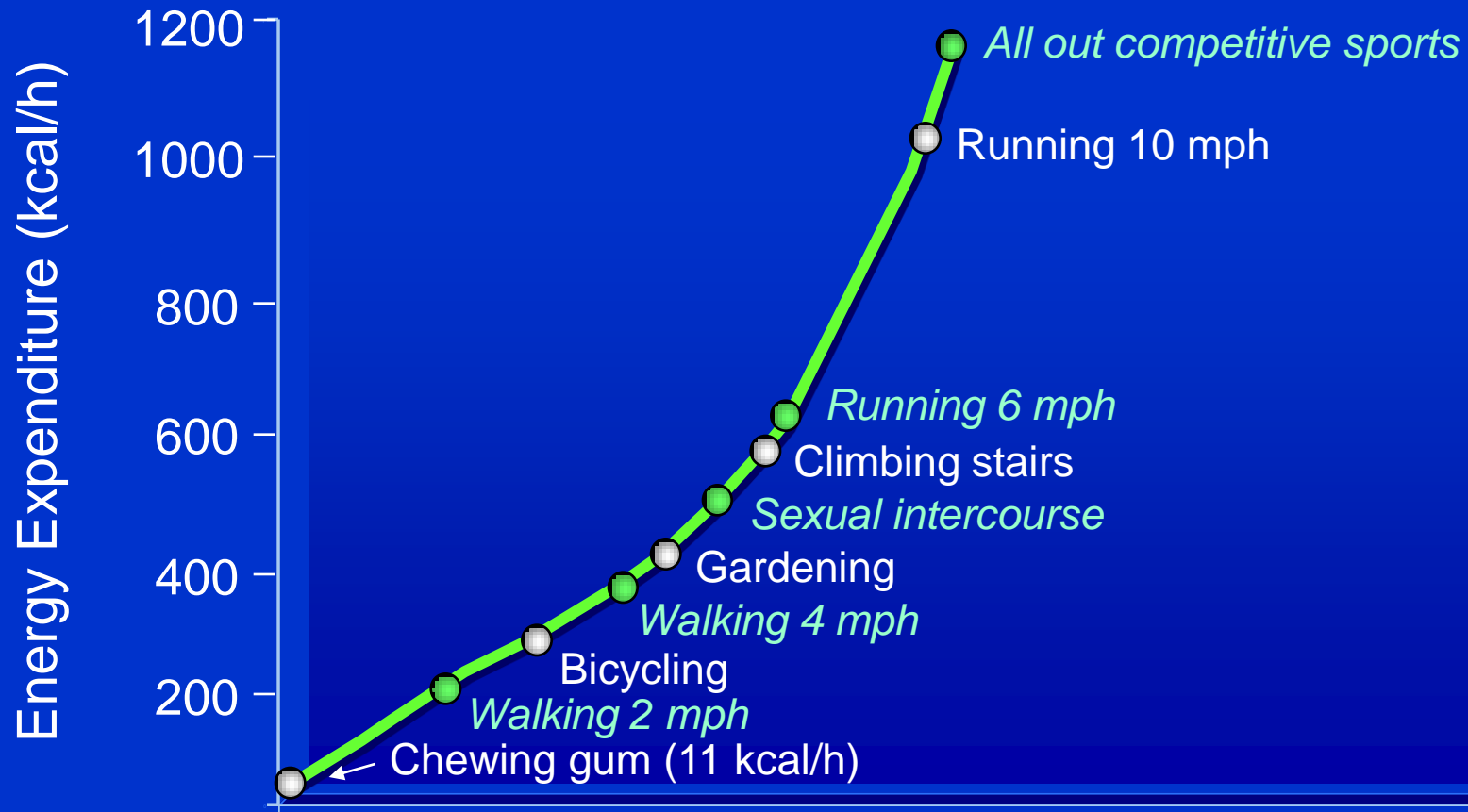


Physical Activity Helps Preserve Fat-Free Mass During Weight Loss



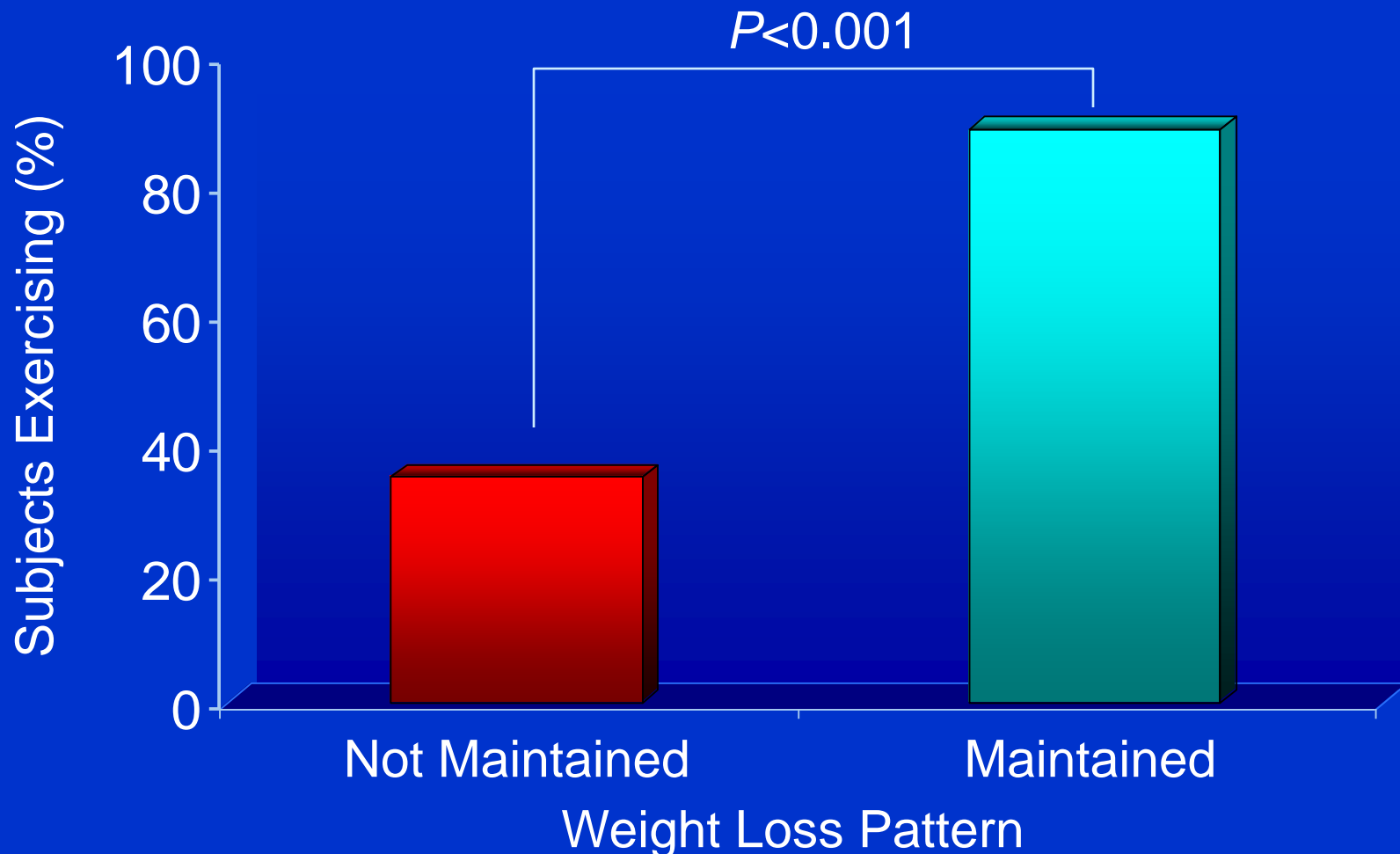
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Energy Expenditure of Physical Activity



Adapted from: Alpers. Undergraduate Teaching Project. Nutrition: energy and protein. American Gastroenterological Association, 1978.

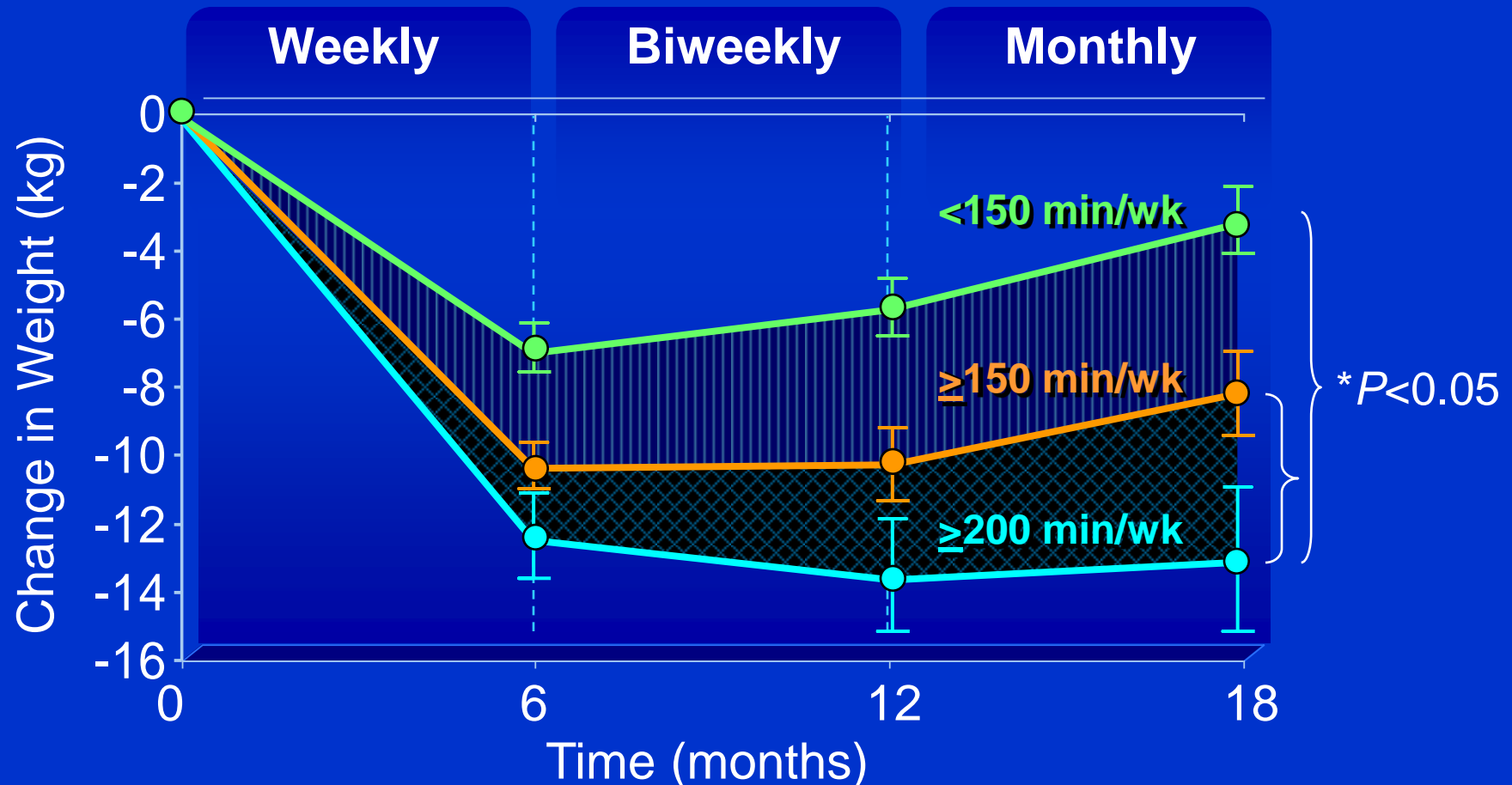
Relationship Between Physical Activity and Maintenance of Weight Loss



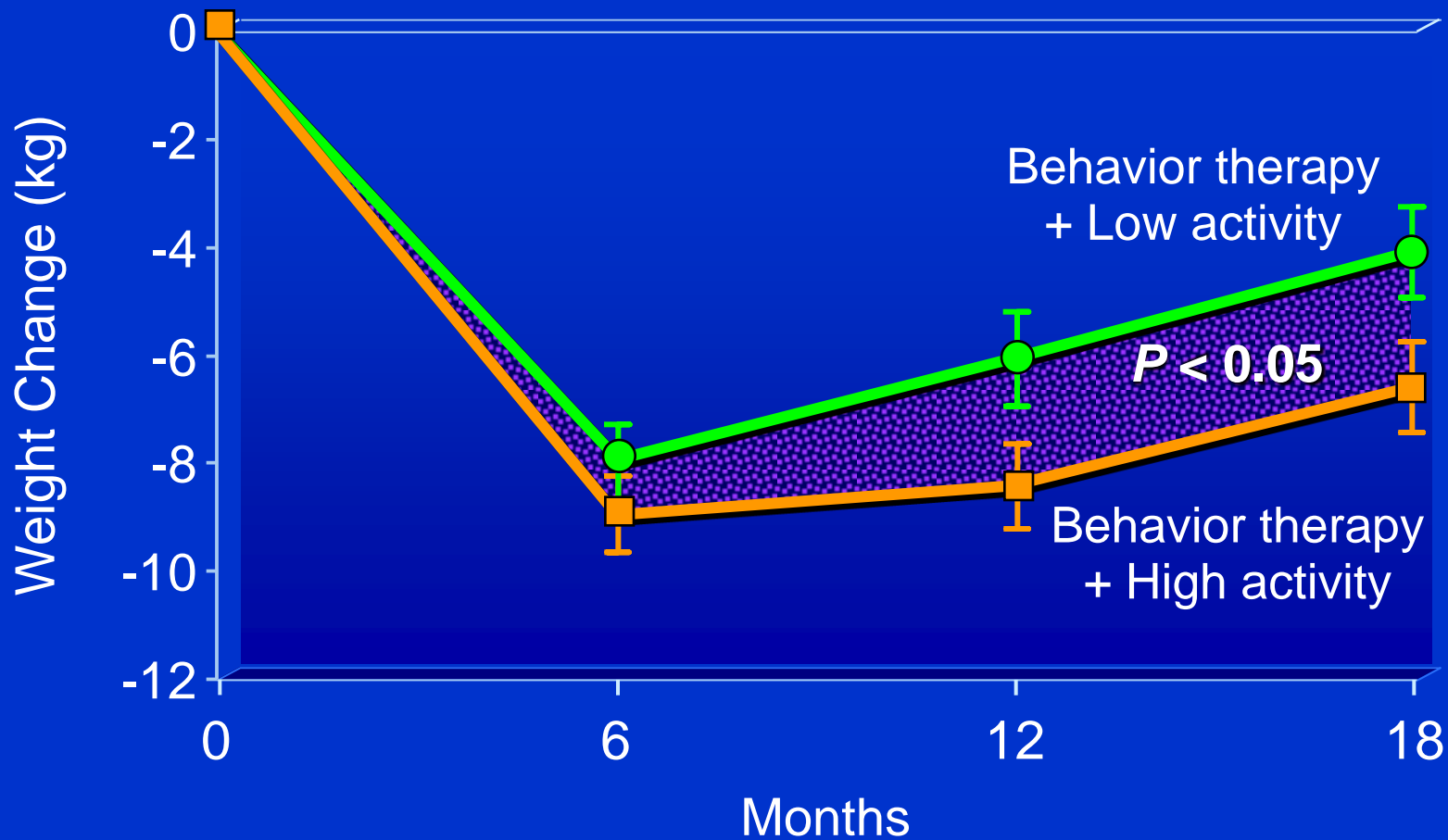
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Considerable Physical Activity is Necessary for Weight Loss Maintenance

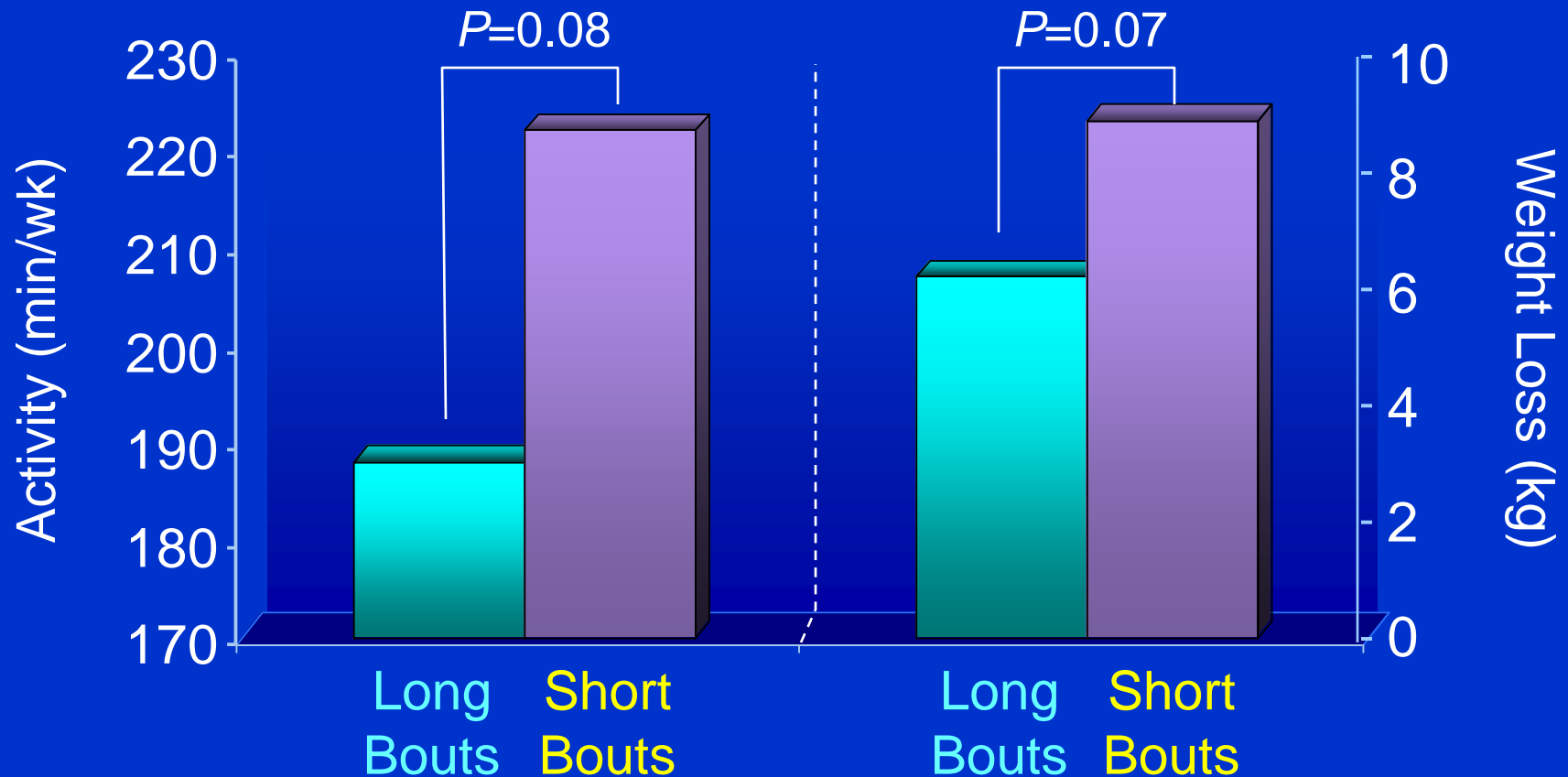
Concomitant Behavior Therapy



Effect of Low-Activity (1000 kcal/wk) and High-Activity (2500 kcal/wk) on Body Weight



Effect of Long vs Short Bouts of Exercise on Total Amount of Activity and Weight Loss

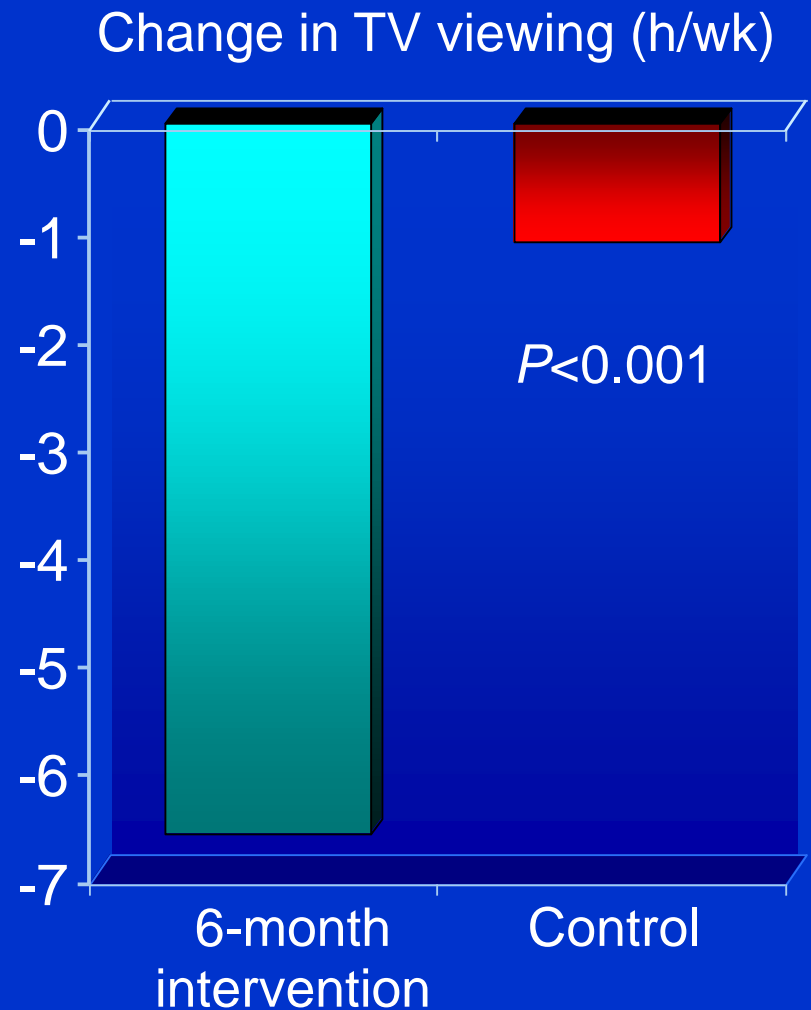
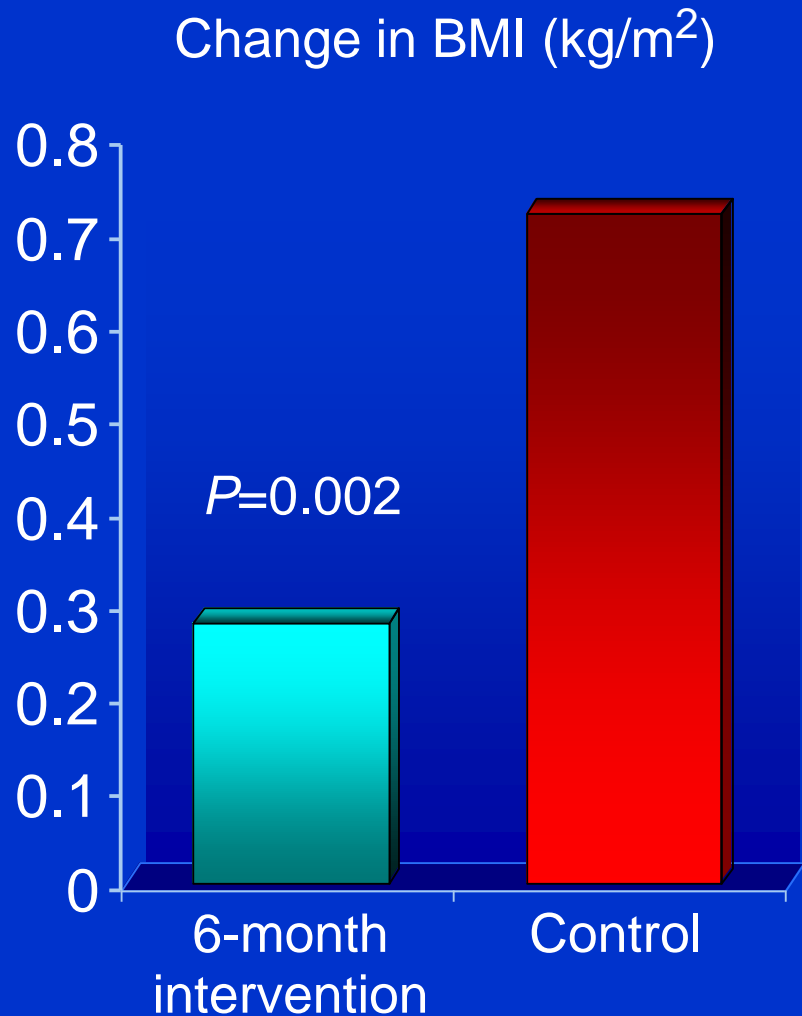


Long bout = one 40-min session.

Short bout = four 10-min sessions.

Jakicic et al. *J Obes Relat Metab Disord* 1995;19:893.

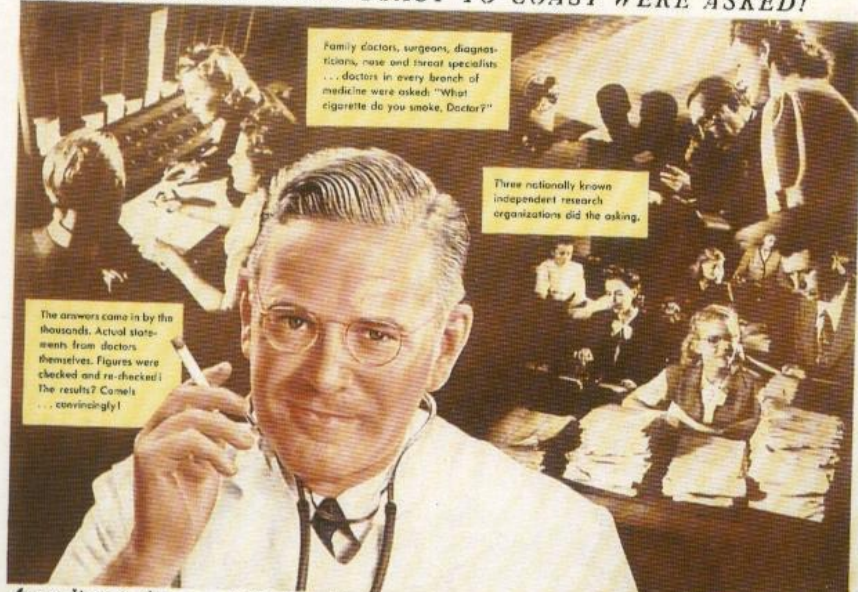
Decreasing Television Viewing Leads to improved Body Mass Index in Children



Smoking

Paradigm Shifts...

113,597 DOCTORS FROM COAST TO COAST WERE ASKED!



Family doctors, surgeons, diagnosticians, nose and throat specialists... doctors in every branch of medicine were asked: "What cigarette do you smoke, Doctor?"

Three nationally known independent research organizations did the asking.

The answers came in by the thousands. Actual statements from doctors themselves. Figures were checked and re-checked! The results? Camels... convincingly!

According to this recent Nationwide survey:

MORE DOCTORS SMOKE CAMELS THAN ANY OTHER CIGARETTE!

This is no casual claim. It's an actual fact. Based on the statements of doctors themselves to three nationally known independent research organizations.

THE QUESTION was very simple. One that you...any smoker...might ask a doctor: "What cigarette do you smoke, Doctor?"

After all, doctors are human too. Like you, they smoke for pleasure. Their taste, like yours, enjoys the pleasing flavor of costlier tobaccos. Their throats too appreciate a cool mildness.

And more doctors named Camels than any other cigarette! If you are a Camel smoker, this preference for Camels among physicians and surgeons will not surprise you. But if you are not now smoking Camels, by all means try them. Compare them critically in your "T-Zone" (see right).

CAMEL-COSTLIER TOBACCO

THE "T-ZONE" TEST WILL TELL YOU

The "T-Zone" is the taste and throat area which you must pay attention to... how it affects your throat. On the basis of the experience of many, many millions of smokers, we believe Camels will win your "T-Zone" to a "T."



"GOT A COLD?" THEN IT'S TIME TO CHANGE TO SPUDS



ENJOY THEIR COOLING SMOOTHNESS AND GIVE YOUR THROAT A REST!

New, improved Spud Imperials are made for a purpose—designed to safeguard your throat from irritation caused by ordinary cigarettes.

SPUDS ARE SUPERIOR IN 3 WAYS:

GREATER SAFETY—The special moisture-retaining agent used in Spud Imperials does not produce acrolein—a throat irritant found in the smoke of nearly all cigarettes. In addition, Spuds are made 20% longer to give you a cooler, better filtered smoke.

MILDER MENTHOL—An exclusive, patented process distributes menthol more mildly and evenly throughout Spuds. No "menthol overloadings!"

BETTER QUALITY—Spud Imperials are made of an extremely mild blend of the finest vintage tobaccos—aged to perfect mellowness. No coupons—just high quality tobacco!

Try the new, improved Spud Imperials. Smoke them as long as you like—and by all means change to Spuds when your throat is irritated. It's safer—and you'll get real smoking pleasure. The Axton-Fisher Tobacco Co., Inc. "House of Tradition."



NOSE or THROAT CONGESTED? IT'S TIME TO CHANGE to SPUDS



ENJOY THEIR SOOTHING COOLNESS AND GIVE YOUR THROAT A REST!

If a cold is making your head stuffy, your throat tender—making your regular cigarette tasteless or "harsh"—there's a definite common-sense reason why you should change to Spuds. For new, improved Spud Imperials are made for a purpose—designed to protect your throat from irritation caused by ordinary cigarettes.

SPUDS ARE SUPERIOR IN 3 WAYS:

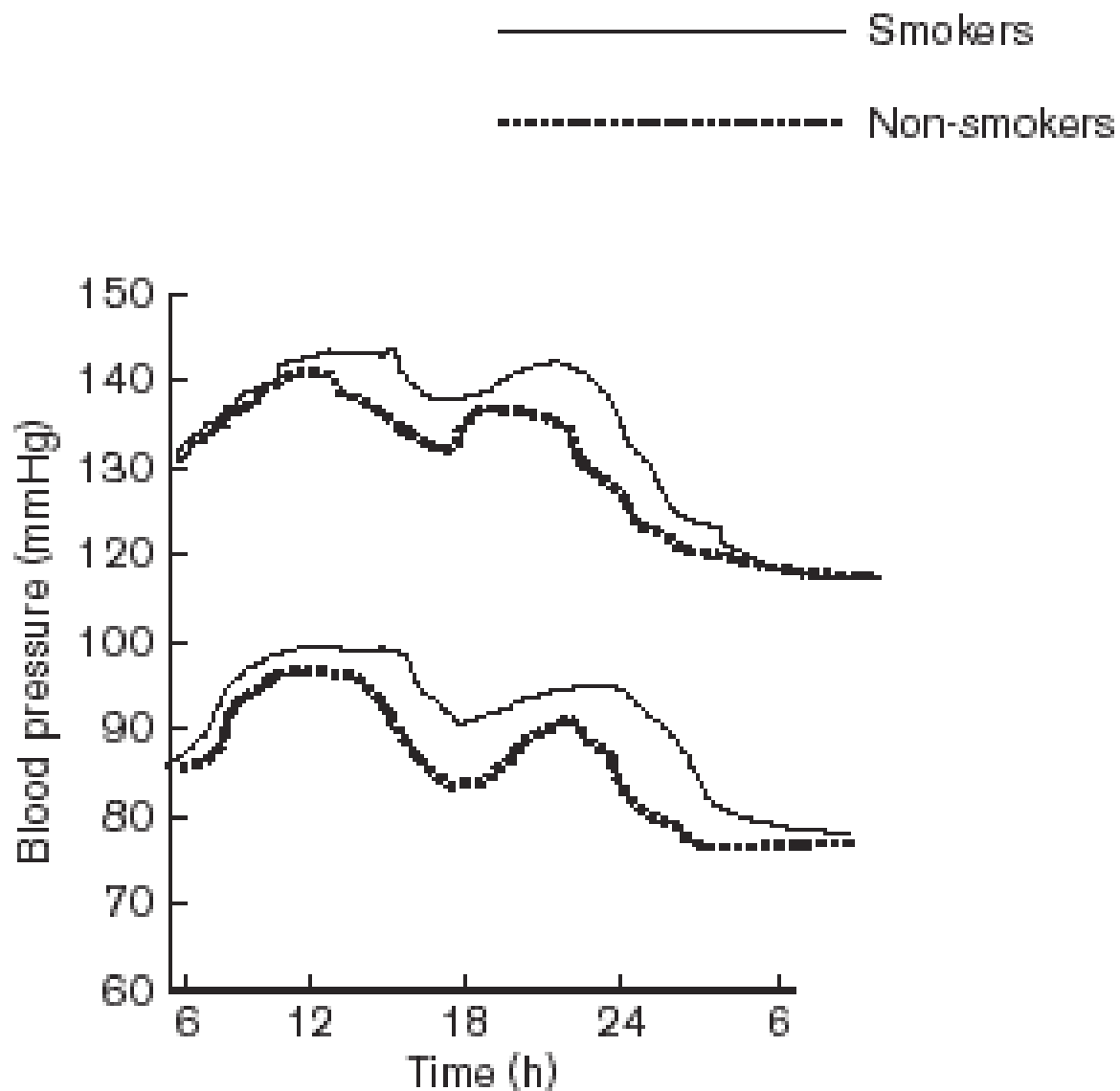
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24-h blood pressure monitoring curves in smokers and non-smokers.

20 CLASS A
CIGARETTES

